THE *Soybean Digest*

REG. U. S. PAT. OFF.

GEO. M. STRAYER, Editor KENT PELLETT, Managing Editor

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QUESTION: Does a Hammermill's Horsepower determine its Capacity?

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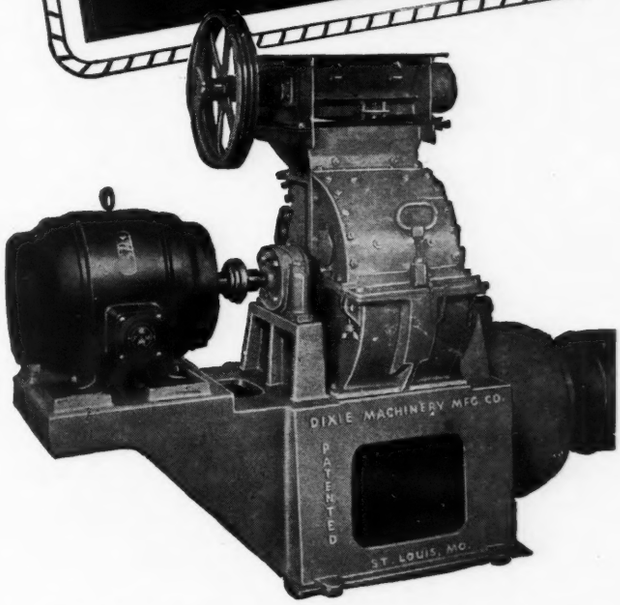

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EDITOR'S DESK

Committee Report on Soybean Research A complete account of the report of the soybean and flax committee is carried in the "Washington Digest" column in this issue.

The recommendations, for research projects to be undertaken under the Hope-Flannagan act, are worth your careful study. The problems involved affect the entire industry. It now appears that Congress will appropriate enough money so really extensive research projects can be carried out under the terms of the act. Eleven million dollars is the amount tentatively named to be made available, it is reported.

The February Soybean Conference in Peoria spotlighted the various problems of the industry that require the attention of research men. The committee now has filled in the outline for attacking these problems.

The four main lines of research, as reported by Porter Hedge, are:

1—Intensified research into improving the flavor stability of soybean oil.

2—More research on production and use of oilseed proteins.

3—Improvement in farm storage for soybeans.

4—An improved system of grading and market news service.

Soybean growers have a very direct interest in the last two named. As they watch the big crop of soybeans in its neck-and-neck race to maturity with the first killing frost they are going to remember the dizzy gyrations in the soybean market last fall and winter, all of which were not to the growers' profit. They will be much more interested in farm storage than they have been in the past, as a means of steadying the market. And they will be in better position to do something about farm storage this year.

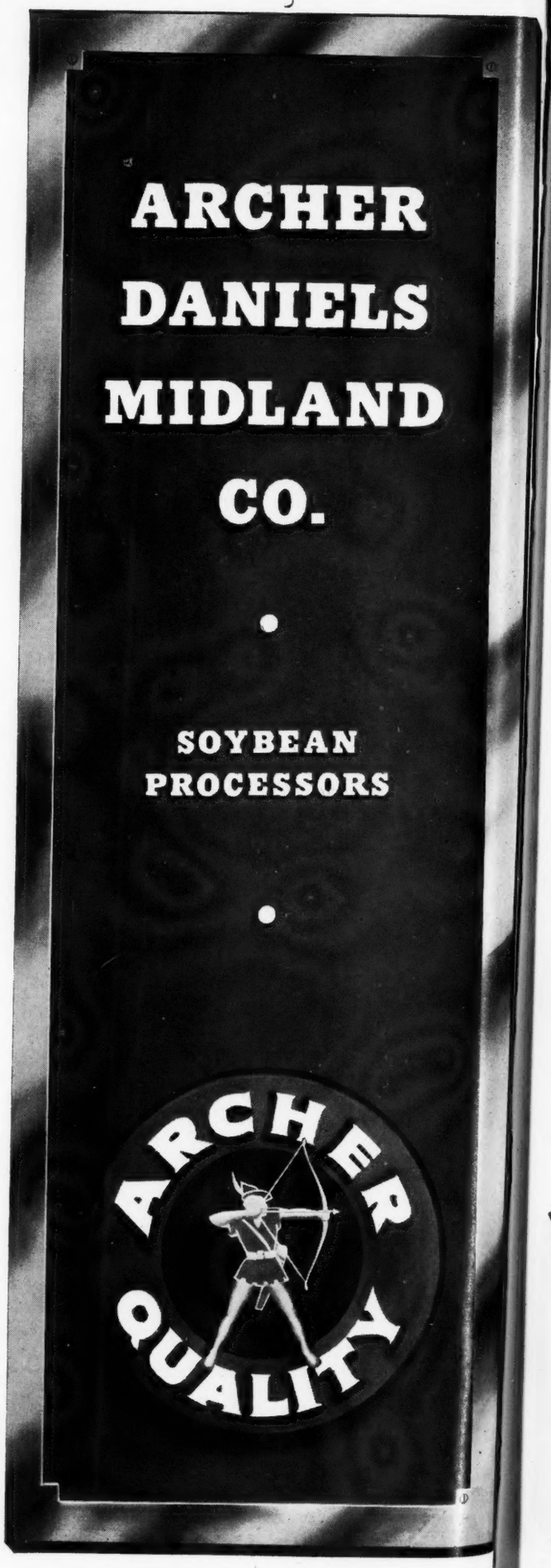
The combine-to-elevator-to-processor system of marketing that grew up during the war sadly needs overhauling. For this reason all information on soybean storage that researchers can uncover will be of much interest to the entire industry.

* * * *

A change in the grading standards to allow payment on the basis of oil content will also be of interest. Soybeans are an oilseed rather than a grain, and should be so graded. But a test must first be devised for oil content that the average elevator operator can apply. When this is done growers of new high-oil-content varieties will be able to realize a premium for them.

The industry as a whole would benefit from more complete economic information on soybeans and more complete market news service.

For Hedge's report see page 38.



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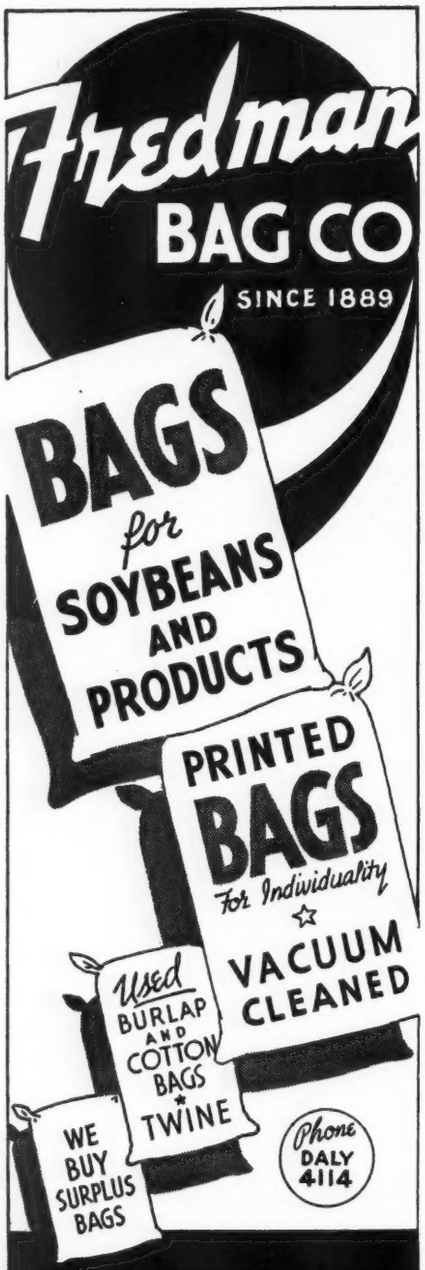

GROWERS

In Oklahoma

Late to medium-late varieties of soybeans make the best yields in most Oklahoma conditions, reports Hi W. Staten of the Oklahoma Experiment Station at Stillwater.

Top yielders in 1946 at most locations included Ogden, Dortchsoy No. 2 and 7, Arksoy and Ralsoy. This is reported in an Experiment Station leaflet, *Soybean Variety Testing in Oklahoma, 1946.*

Best grain yields are obtained from May 15 to June 1 planting dates, a date of planting test at Stillwater last year indicates. Earlier planting dates make a large plant growth, but the July and August dry weather which occurs at Stillwater every year causes the leaves to fall. The resulting bean crop is shriveled and poor in quality. Beans planted at the later dates do not make so large a plant growth and seemingly stand the dry weather much better.

Even the very late planting date of June 15 made a good bean crop, but poor stands and jackrabbits caused general low yields.

"The long and severe summer drought last year caused low yields at all locations," reports Staten. "In many locations where it was possible to compare soybeans with corn, we found that the soybean yield in bushels per acre was equal to or greater than that of corn. Where beans were planted on good corn land, the bushels-per-acre yield was very good regardless of the severe dry weather."

WMT to Rescue

Radio Station WMT, Cedar Rapids, Iowa, helped out in the recent soybean seed emergency by requesting listeners to send in information on supplies of early-maturing soybean seed.

When the worst floods in history ruined a lot of Iowa corn and other crop land, many seed dealers were completely sold out of early bean varieties. Chuck Worcester, farm service director for WMT, broadcast an appeal for information on early soybean seed supplies.

Incorporating his appeal with wire recorded broadcasts direct from inundated farms at the peak of the flood disaster, Worcester made it a "neighbor-to-neighbor" request for farmers further north (in early variety territory) to make seed available for farmers in central and southern Iowa.

Within 3 days, more than 13,000 bushels of the recommended early soybean varieties were located, through the station's efforts.

A list of these sources was promptly made available to farmers, to local county agents in the flooded areas and to state crop officials.

Grain Standards

The U. S. Department of Agriculture has announced that no changes are contemplated in the official grain standards of the United States for soybeans during the current year.

Informal hearings were held in May at Toledo, Peoria, Chicago and Cedar Rapids to afford interested persons an opportunity to express their opinions as to whether changes should be made in the present official standards. Subjects to be discussed at the hearings were published by the Department in April. These included matters of definition, splits, damaged kernels, foreign material, and moisture content. Opportunity was also given to those who desired to do so to express their opinions to the Department in writing prior to May 29.

From the information obtained at the informal hearings, from the written opinions submitted, and from other information available, the Department announced it does not feel warranted in revising the official standards for soybeans at this time.

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Gets High Yields

Although most soybean growers plant in rows, Ray Bolomey, Pike County, Mo., prefers to seed with a drill. And he gets outstanding results, reports *Missouri Ruralist.* Last year his soybeans made 35 bushels an acre, the year before 36.6 bushels.

Soybeans in rows make it possible for growers to cultivate and control weed growth. But Bolomey takes care of weeds before seeding and seldom has difficulty later. He disks several times in spring, early and late. He makes certain the soil is clean at seeding time.

Actually, there is more reason for his high yields than just his method of seeding and preparing soil. He uses a rotation of clover, corn, soybeans, wheat and clover. He fertilizes corn heavily. The soybeans receive an advantage from fertilizer residue. Then he applies another heavy application of fertilizer for the beans. Last year he used 400 pounds of 3-12-8, a total of 12-48-32 available plant food.

Lime, too, is an important item in his program. Bolomey says you can't put too much lime on in his part of Missouri. In the last few years all his ground has been limed with 3 tons an acre. But most of it has received 5 and 6 tons in the last 7 or 8 years.

Soybean Ruling

District Judge Harry E. Narey of Buena Vista County, Iowa, has ruled that the price on date of delivery governed sale of farm grains while OPA controls were in effect, even though payment was not made until after controls were eliminated.

His ruling was in a case involving soybeans delivered a few days before price control was eliminated. A boom price period followed the elimination of price control last October and the farmer sought the higher price.

The beans were delivered to the Truesdale Cooperative Elevator Co. between Oct. 3 and 12 when the OPA ceiling was $2.25 a bushel. Price control on grain was lifted Oct. 16 and the farmer returned to the elevator on Oct. 18 for settlement. The farmer claimed $3 a bushel which the elevator refused to pay. The farmer tried to replevin the beans which the elevator refused.

In his decision, Judge Narey held that the beans in question should be paid for at the price in effect on dates of delivery.

In the South

Demands for soybean seed have greatly increased over last year in the Mid-South, L. F. Young, vice president, Russell-Heckle Seed Co., Memphis, stated. "The Lincoln variety is drawing the interest of many planters in the South. Planters in Greenwood, Miss., harvested a crop of Lincoln beans last August 10, before cotton picking started." This is reported by *Oil Mill Gazetteer.*

Amazing Growth

Over half of the soybeans produced in the U. S. in 1946 were of the Lincoln variety, reports J. L. Cartter, of the U. S. Regional Soybean Laboratory, Urbana.

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LETTERS TO THE EDITOR

High Praise

TO THE EDITOR:

As you may well imagine, a large number of trade organizations' publications find lodgment on my desk. Of all these numerous publications, in my opinion, the *Soybean Digest* is by far the best, and I take this occasion to congratulate you and your associates in publishing a first class document.

In fact, my only complaint is that the *Digest* is so interesting that I spend a good deal of time with it, often reading it through twice from cover to cover.

Again I say congratulations and regards. —John W. Ticknor, assistant to president and treasurer, National Farm Chemurgic Council, Inc., 350 Fifth Ave., New York.

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AS THE PRESS SEES IT

Dairyman and Oleo

Rep. Fred Harter of Akron, said to be the only dairy plant operator in the Ohio House of Representatives, has said he would vote for the controversial colored oleo bill as amended.

The measure would permit the sale of colored oleo, now forbidden by state law. Approval was given the measure at a recent session of the Senate.

Harter who is head of the Belle Isle Dairy at Akron, Ohio said: "I have been engaged in the dairy business practically all my active life, and as a member of the industry, I might find it personally advantageous to oppose the bill. However, I believe that one in public office must approach any problem from the standpoint of the public interest. I feel that the housewife is entitled to relief from the arduous mixing task required by the present law."

Harter said he didn't believe that oleo had replaced butter, nor would it replace butter, in other states where colored oleo is permitted to be sold.

"Since the bill as passed by the Senate carries an amendment requiring the use of domestic oils rather than the cheaper imported oils," Harter said, "the farmer is protected and I shall vote in favor of the bill."—*Dairy Record.*

ASA'S 27th Annual Convention --- Are You Planning to Attend?

The program of the 1947 convention of the American Soybean Association is now rapidly taking shape; and the complete program will be carried in the August issue.

The Deshler-Wallick Hotel will be convention headquarters. It and other Columbus hotels will have facilities available to members. All main sessions will be held in the ballroom of the Deshler-Wallick. Exhibits by firms serving the industry will be on its mezzanine floor.

Thursday, September 4, will be devoted to field trips to Ohio State University farms —to Madison Farm in the morning and Sinclair Farm in the afternoon — with noon lunch on the University campus.

Formal sessions will be held Friday and Saturday, September 5 and 6. The banquet will be held on Friday night. Annual business meeting is Saturday morning, with final program sessions following and ending Saturday afternoon.

Turn the page for an account of the convention city and the features of interest to soybeaners at Ohio State University.

USE THIS FORM

It is time to make your room reservations at the Deshler-Wallick Hotel for the American Soybean Association convention in Columbus September 4-5-6 if you have not already done so. Simply fill out, clip and mail this form to Deshler-Wallick Hotel, Convention Department, Columbus, Ohio.

RESERVE	Check Here	Rate $
Single Room (One Person)		
Double Bed (Two Persons)		"
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A Suggestion

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DOUBLE ROOMS FOR TWO (Double Bed)
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$5.50, $6.60, $7.70, $8.80, $9.90, $11.00, $13.20

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Convention of American Soybean Association

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	350-lb. barrels	100-lb. burlap bags	50-lb. paper bags
Container cost	$7.90	$3.50	$1.60
Labor cost	1.33	1.00	.66
Total bag and labor cost	$9.23	$4.50	$2.26
Saving per ton paper over barrels			$6.97
Saving per ton paper over burlap bags			$2.24

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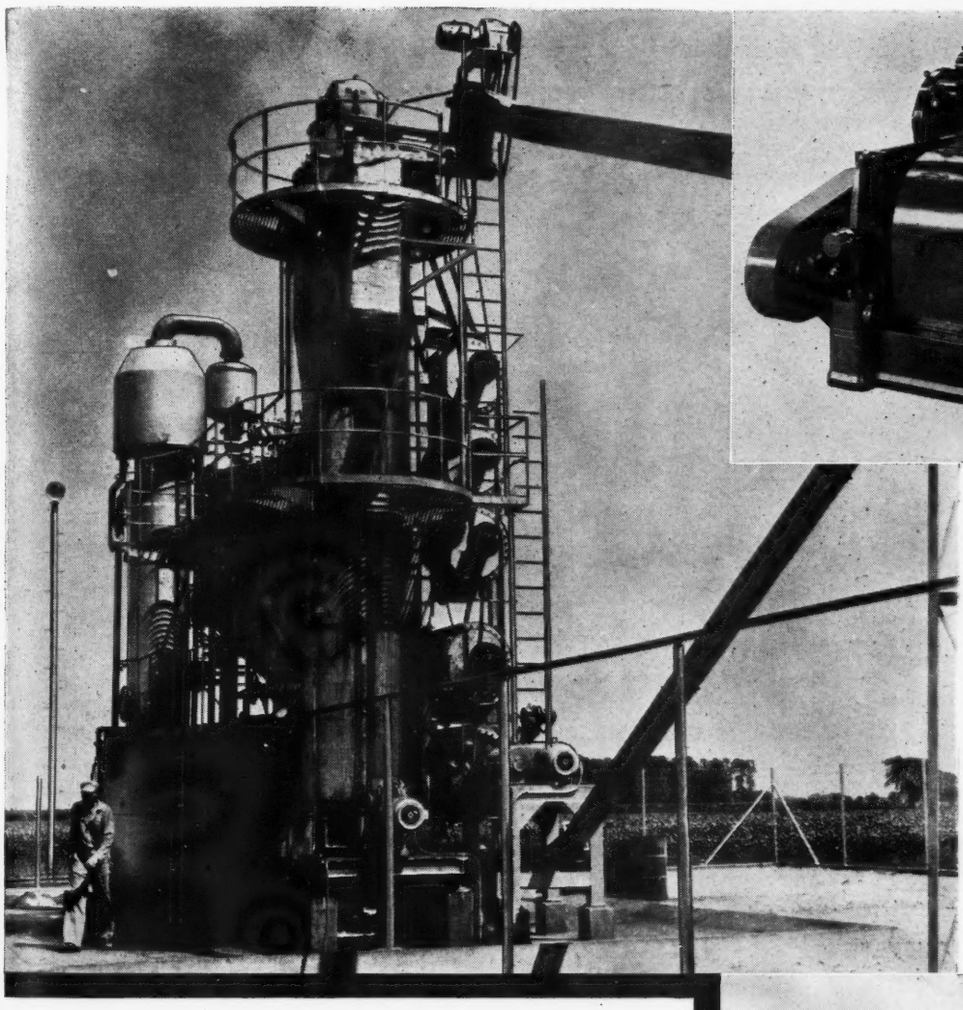
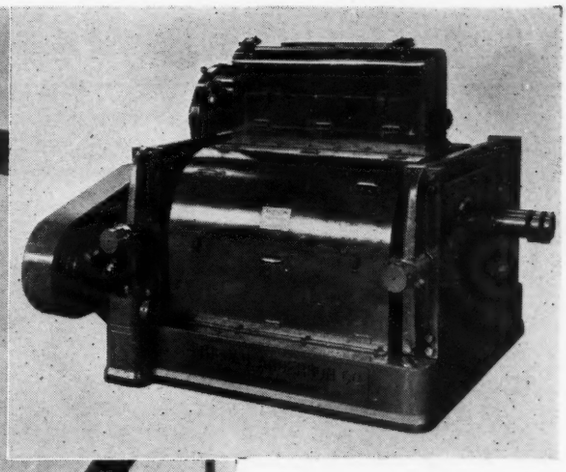


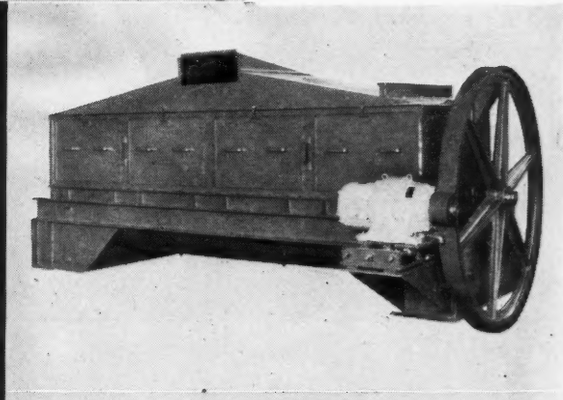


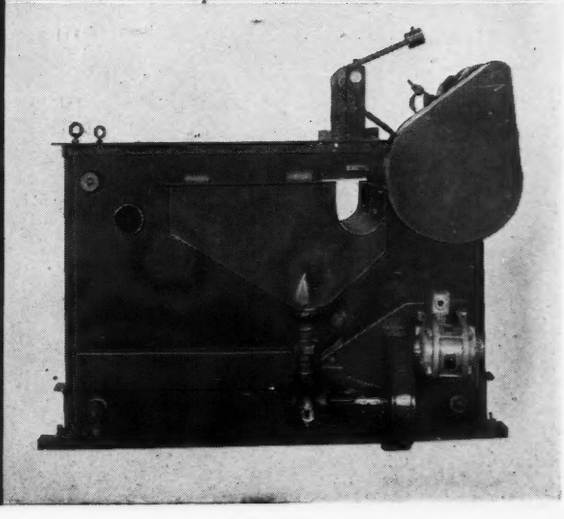
Left, Anderson Solvent Extraction Unit.

Above, Anderson 24 x 40 Flaking Mill.

Below, Anderson Gravity Scraper Dryer.

Bottom, Anderson Screening Tank.





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COLUMBUS---
Convention City

You are looking at downtown Columbus from the air. Tall tower in the center background is the Deshlar-Wallick Hotel, American Soybean Association convention headquarters. In center foreground is the State House and annex. Federal Highway 40 crosses the Scioto River at the left.

Columbus, Ohio, host to the American Soybean Association convention September 4, 5 and 6, is the third largest capital city in the nation. Columbus has excellent transportation facilities, being within an overnight's ride of two-thirds of the principal cities of the country.

A highway system radiates from Columbus throughout all of the states. Its airport is comparable with any on the coast-to-coast route. Hotels are thoroughly modern and centrally located. Rates are reasonable.

Of special interest to our membership are the Batelle Memorial Institute and the National Farm Chemurgic Council. The council's headquarters is located in Columbus, at 1368 N. High St. Columbus ranks well not only with the soybean industry, but also in all other agricultural products, including dairying.

Townshend Hall, headquarters of the College of Agriculture at Ohio State University.

It is the center of a great educational area with more than 40 colleges and universities, which are located within the boundaries of the state of Ohio. These include Ohio State University at Columbus, where a field trip is planned the first day of the convention.

Among points of interest in Columbus is the historic State House, now almost a century old. It is reputed to be the best specimen of Doric architecture of any public building in America. The building in which the American Federation of Labor was organized 60 years ago still stands and is a shrine for labor organizations.

The Columbus State Hospital, 1¼ miles in circumference, is the largest of all state hospitals today. The historic Ohio Penitentiary is located within a few blocks of the leading hotels. The original cells were erected a century ago. The penitentiary is always available for tours. It was the scene of the worst prison fire in the history of the country when 323 prisoners were burned to death in their cells on Easter morning of 1930.

The Seagrave Manufacturing Co. distributes more fire equipment than any other similar organization. The Jeffrey Manufacturing Co. produces more mining machinery and the Columbus Coated Fabics more yardage of oilcloth than similar industries of the kind.

Ohio and its capitol city will prove their reputation for hospitality in true American style when soybeaners congregate there.

American Soybean Association convention visitors to Columbus may have the opportunity to visit three large-scale soybean projects now being conducted by experts on the staff of Ohio State University, the nation's fourth largest educational institution, and the Ohio Agricultural Experiment Station at Wooster. You will see the University and its experimental farms September 4, the first day of the convention.

While the schedule of convention visits to these projects will depend on growing conditions prior to the Association's annual meeting, present plans include trips to the Madison County Farm, the Sinclair

(Continued on page 26)

Students at the campus gates of Ohio State University.

Ohio State University campus as you see it from the air.

You Will See the University's Soybean Work on Exhibition Sept. 4

HAIL DAMAGE *to Soybeans*

An overall picture of the simulated hail damage tests. Different degrees of damage done at different stages of growth of the soybean plant are shown.

By SEABRON CALHOUN

FOR THE PAST 4 years Robert R. Kalton and J. C. Eldredge of the Iowa Agricultural Experiment Station at Ames have been working on tests simulating the damage done to soybeans during hailstorms.

Since 1943, the experiment station in cooperation with the U. S. Regional Soybean Laboratory has attempted to answer questions of primary concern to farmers, insurance adjusters and processors in areas where the damage has been the worst.

According to Kalton and Eldredge, the change in the yield of seed, the quality of the seed and effect on the date of maturity are only a few of the many questions that the experiment sought to solve.

The experiment was set up in three parts, the simulated hail tests, the stand reduction tests and the defoliation tests. The tests were expanded in 1944 after just 1 year of testing. So, in order to cover the complete test, the averages used here are from the 1944 to 1946 results.

The beans that were tested were grown in rows spaced 40 inches apart in order to eliminate as much as possible competition between plots treated differently. Simulated hail injury was inflicted on replicated rows at 10 different stages of growth. At each date of damage three degrees of severity of damage were inflicted. These were called light, medium and heavy. Check rows, with no damage, were used for comparison.

The researchers stated that an attempt was made in this type of damage to simulate as closely as possible actual hail injury. The type of damage inflicted caused leaf defoliation, removal of the growing points, removal of branches and parts of the stem, and various degrees of bruising. Hail storms may cause any one or all of these types of injury to soybean plants in the field. Except for the simulated injury and for weed removal, the plots used in these studies were handled in such a manner as to approximate actual farm conditions.

The removal of leaves and parts of the stems was done with a paddle-like board with several wire hooks mounted on it. The actual damage was done with upward strokes of this board. Clipping shears and supple switches were also used.

SIMULATED HAIL TESTS

In the measurements on yield of seed in the simulated hail tests, the reduction in yield became greater as the severity of damage increased. *The greatest reduction in yield occurred at the stage of growth when the pods were plainly evident at the top of the plant.* Also all flowering had ceased. At this stage, the reductions were almost in direct proportion to the amount of damage inflicted. At other stages, the reductions were not quite so great.

The effect on the date of maturity was not too apparent with light damage, it was revealed. But medium damage up to and including the full-bloom stage retarded maturity several days. Heavy damage during the same period retarded maturity a week or more. Faster pod drying was promoted when damage was incurred at the last two stages.

EFFECT ON PLANT HEIGHT

Plant height was affected most when the damage was done during the first half of the growing period. In this period, the decreases in plant height increased with the severity of damage. Little effect was shown on height in the last portion of growth since plant elongation had been practically completed.

EFFECT ON SEED QUALITY

Seed quality is an important factor in determining market grade and price both Kalton and Eldredge pointed out. In general, the quality of the seed became poorer by increasing the amount of injury. Injury during the time of pod and bean development caused the poorest quality seed with medium and heavy damage. Light damage had little effect on seed quality according to the results of the tests.

EFFECT ON CHEMICAL COMPOSITION

Chemical composition of the seed was determined for the 1944 and 1945 simulated hail tests. The chemical composition has not been compiled for the 1946 tests as yet, but according to Kalton and Eldredge they will be available at a later date.

In the percentage of protein no consistent effect was shown by any degree of injury at any stage of growth. However, the percentage of oil and the iodine number were affected at certain stages.

Greatest reduction in oil percentage occurred during pod and bean formation. The effect on the iodine number was opposite to that of the oil percentage. When the greatest reduction in the percentage of oil occurred, the iodine number was increased.

In comparison with the other results, the losses in yield have been the most marked. But the effect on the other characteristics is important too. Setbacks in maturity increase the danger of frost injury, especially when full season varieties of soybeans are grown.

Marked decreases in plant height increase combining difficulties because of the

● *Another report on the simulated - hail - damage - to - soybeans tests under way at Iowa State College since 1943. For an earlier article on the subject see our June 1946 issue.*

inability to harvest pods close to the ground.

A lowering in seed quality and oil percentage is reflected in a lowering of market prices. Inasmuch as these effects are most apparent with heavy damage, they deserve consideration along with the main effects on yield in estimating severe hail losses the two experimenters said.

STAND REDUCTION TESTS

Since many hail storms cut off various portions of the soybean plant, the stand reduction tests were conducted in an attempt to measure the losses inflicted.

Part of the plants were cut off at ground level in varying percentages at the different stages of growth. The other half of the plants were cut off at one-half their height. The percentages used were 25, 50 and 75 of the stand. The greatest reduction in the yield occurred when 75 percent of the plants were removed at ground level at the last stages. The average loss in yield in that case was 73 percent, very closely approximating the loss in tne stand.

DEFOLIATION TESTS

Defoliation of soybean plants in varying amounts is caused by every hail storm. And an attempt was made the testing to determine what effect different amounts of defoliation had on yield and other characters in soybeans.

The percentages of leaves removed were 10, 25, 50, 75 and 100, with non-defoliated rows for comparison. The results showed that the smaller amounts of defoliation at the earlier stages of growth had little or no effect on yield. Loss of leaves at the pod and bean development stage caused the greatest reduction in yield.

From the results obtained in the stand reduction and defoliation tests it appears that they are two of the main factors contributing to the injurious effect of simulated hail injury to soybeans. The greatest effect on yield and other characters resulted when a combination of defoliation, stand reduction, and bruising were inflicted simultaneously.

Weather conditions and cultural care, especially weed control, are important following hail injury. With proper weed control and a plentiful supply of moisture, soybeans not too badly damaged by simulated hail injury up until the time they were in blossom, came back and gave a fairly good yield.

—s b d—

METHIONINE LIMITING IN SOYBEAN PROTEIN

A study of the best heat treatment to bring out the full biological value of soy protein in animal and livestock feeding was reported in a paper by J. Fritz, E. H. Kramke, and C. A. Reed of the Borden Co., New York, presented at the American Chemical Society's 111th national meeting.

"Not all soybean products are equally valuable from a nutritive standpoint," the report explained. "Moist heat, as provided by pressure cooking, gave the best results. When ground raw soybeans were used, 20 to 30 minutes of pressure cooking at 15 pounds pressure gave the best nutritive value. If solvent extracted soybeans were used, less heat seemed to be required.

"In these experiments turkey poults were used to measure the biological value of the soybean protein. When the soybeans had been over-heated, the amino acid lysine was destroyed or at least made unavailable to the poults. This caused the poults to lose feather pigmentation, and enabled the research workers to judge the extent of the damage to the soybean protein.

"Dry heat was especially harmful to the soybean protein. It was impossible to obtain a good soybean product through the use of a dry air oven. On the other hand, pressure cooking could be continued up to about 1½ hours before any appreciable damage was apparent. The additions of amino acids to heat damaged soybean products were helpful but did not fully correct the over-heated material.

"The addition of the amino acid methionine to commercial soybean meal, made by the expeller process, increased the biological value of the meal. This confirms previous data indicating that methionine is the first limiting amino acid in soybean protein."

—s b d—

NEW FATS PREDICTED

"Custom-built" fats with revolutionary characteristics were predicted by Stanley G. DeNisco, speaking before the Metropolitan Food Technologists Club in New York City recently, *Food Field Reporter* says.

Mr. DeNisco, of the department of applied research, Standard Brands, said that soybean and cottonseed oil, milk and salt are the principle ingredients, of margarine.

Here you see the effect of 100 percent defoliation done at different stages of growth.

PROBLEMS IN THE USE OF

SOYBEAN OIL MEAL *for Feed*

. . . AND SOY FLOUR FOR FOOD

By J. W. HAYWARD

● *From a speech at the Soybean Conference at Peoria, Ill., in February. Dr. Hayward, who is director of research for the Archer-Daniels-Midland Co., points out some of the research problems in connection with both soybean oil meal and soy flour.*

THE GROWTH of the soybean industry in the United States is unparalleled by any other agricultural crop. Soybeans were originally raised in this country as a soil improvement crop and for hay. Today, they rank as one of our five leading cash crops. Our farmers realize a greater cash return from soybeans than from any other oilseed crop.

The increase in soybean production during the past 10 years is truly phenomenal. The average annual production for the period 1935-39 was 56,167,000 bushels. The production in 1946 exceeded 191 million bushels. Production figures for soybeans and soybean oil meal and other principal protein concentrates are contained in Table I.

Approximately 95 percent of our annual production of harvested soybeans is processed or used for seed. Soybean products rank among the most versatile vegetable materials known to man. Both the oil and the residual meal are of great value. The list of uses given in table at right is by no means all-inclusive and could be greatly expanded.

USES OF SOYBEAN PRODUCTS

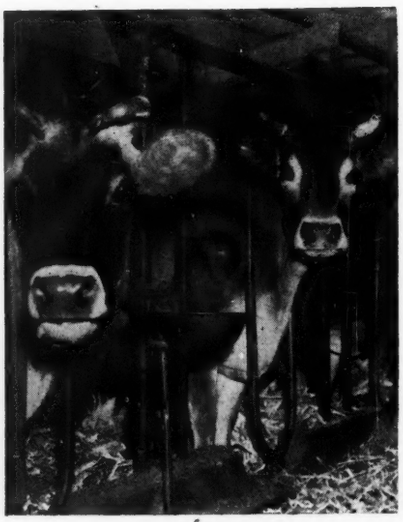
Soybean Oil Meal	Soy Flour	Soy Lecithin	Soybean Oil
Animal feeds	Bakery goods	Bakery goods	Vegetable shortening
Adhesives	Crackers	Confectionery	Margarine
Paper coating	Diabetic foods	Cosmetics	Salad dressing
Paper sizing	Confectionery	Pharmaceutical	Frying oil
Cold water paint	Beverages	Leather	Fatty acids
Plastics	Mayonnaise	Margarine	Alkyd resins
Isolated protein	Macaroni	Shortening	Paints, varnishes, lacquers
Synthetic wool	Prepared mixes	Paints & varnishes	Plasticizers
Fertilizers	Soy sauce	Ink	Printing inks
Orchard sprays	Sausage binder	Textiles	Caulking compounds
Wallboard	Small pet foods	Soaps	Soaps

Some 90 to 95 percent of our soybean oil meal production is customarily used as a protein supplement in feeds for livestock and poultry. Prior to World War II some 3 percent was finding a market in fertilizers, with approximately 1 percent converted by special processing to soy flour for edible use, and 1 percent went for industrial uses such as adhesives, paper coating and the like. During our recent war our government did not permit soybean oil meal to be used in fertilizers but this market is available again now.

Soy flour deliveries by the industry from the years 1930 to 1940 averaged annually about 25 million pounds. The deliveries have increased considerably since 1940 due partly to an increase in domestic use, but equally important were the deliveries of soy flour to various government agencies, largely for foreign use. In 1941 our government took about 10 million pounds of soy flour. In 1943 this increased to 170 million pounds when large shipments went to the British and Russians on lend-lease. The deliveries of soy flour to our government lagged for the next couple of years but jumped to an estimated 200 million pounds in 1946 due to large use made by UNRRA for relief feeding of foreign nations. Our domestic and government soy flour deliveries for 1946 were approximately 380 million pounds.

In our domestic market the bakery is our largest user. Some 40 percent of our domestic sales are for bakery use. Now that the Bureau of Animal Industry has legalized soy flour for use as a binder in meat products, about 20 percent of our domestic sales go to the sausage industry, and the domestic balance goes to other special edible uses.

Soybean oil meal excels all other vegetable proteins as a complete source of the essential amino acids, and properly supplemented, is an adequate supplement for all classes of livestock and poultry.



As indicated in the above, soy flour has become quite popular in our diet during the past few years. This domestic use of soy flour should increase and due to recent developments, more soybean oil meal should find an outlet for industrial purposes. However, it appears that for some time to come 90 percent of our soybean oil meal will find a market in feeds.

In addition to its value as a cash crop, the farmer's interest in soybeans centers about the use of the meal as a feed for livestock and poultry. As a matter of fact war-born shortages of protein supplements very vividly demonstrated the livestockman's dependence upon this excellent source of protein. It has been variously estimated that our total production of all feed protein materials is sufficient to balance only about one-half of all farm rations fed in the United States. This optimum nutritional balance between protein and carbohydrate feeds has never been attained in this country and certainly is being completely ignored right now. During the crop year 1945-46 the total production of all major protein feed (vegetable and animal) was approximately 9,028,000 tons. Soybean oil meal contributed 3,652,000 tons to this total. Next in importance was cottonseed meal. (See Table I for more complete figures).

Not only is soybean oil meal of great importance because of the large quantities available but it also ranks high in the

A DIFFERENCE OF OPINION

Among legume growers right in your community there exists a difference of opinion as to which legume crop will make them the most money. And throughout the nation there are variations in soil, climate, and rainfall which make certain legumes preferable in one section, others elsewhere. There's little difference of opinion, however, among growers, dealers, or jobbers when it comes to the choice of an inoculator. NOD-O-GEN nitrogen fixing bacteria is available to you in a special potent, pretested strain for every legume, no matter what your customers may be growing. You can get prompt shipment from your jobber and the price is right. Decide now to handle this product of superior quality.

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quality of protein which it contains. Countless tests have shown soybean oil meal to excel all other vegetable proteins as a complete source of essential amino acids. To appreciate this statement please refer to Table II entitled "Amino Acid Analysis—Oil Seed Meals" p. 21. When properly supplemented with vitamins, minerals and in some instances unidentified factors contained in certain non-vegetable materials, soybean oil meal constitutes a complete and adequate protein supplement for all classes of livestock and poultry.

Now that we have summarized the status of soybean oil meal in terms of its acceptance in the past and have hinted briefly of its potentialities, let us be more realistic in predicting its future by pointing out some of the specific problems and warnings on the use of soybean oil meal as a feed for livestock and poultry. First we will confine our discussion of this protein supplement to growing animals with a single stomach or animals that depend entirely on pre-formed proteins for their protein requirements. This class of animals includes poultry, swine, dogs, fur-bearing animals, calves and lambs, in contrast to ruminants such as cattle and sheep which can obtain some of their protein requirements from the protein of micro-organisms formed in their paunch from more simple, less complex materials, including urea, as a source of elementary

TABLE I: PRODUCTION OF PROTEIN CONCENTRATES IN THE UNITED STATES

Protein Concentrate	Crop Years October 1st to September 30th							
	Average, 1930-40 1,000 Tons	1940-41 1,000 Tons	1941-42 1,000 Tons	1942-43 1,000 Tons	1943-44 1,000 Tons	1944-45 1,000 Tons	1945-46 1,000 Tons	1946-47 Forecast 1,000 Tons
Soybean Oil Meal	482	1,543	1,845	3,179	3,327	3,630	3,652	3,600
Linseed Meal	248	740	891	794	998	459	561	400
Corn Gluten Meal and Feed	548	759	965	927	842	864	773	950
Cottonseed Meal	1,951	1,862	1,821	2,078	1,790	1,982	1,434	1,425
Peanut Meal	38	137	71	109	111	96	83	100
Copra	120	70	33	33	33	42	69	125
Tankage and Meat Scraps	642[3]	811	874	882	975	792	745	750
Fish Meal	234[3]	262	208	215	196	209	181	180
Dried Milk[1]	135[3]	145	125	105	100	90	80	85
Other Dried Milk Products[2]	1,616	1,735	1,685	1,660	1,545	1,515	1,450	1,460
TOTAL	6,014	8,064	8,518	9,982	9,917	9,679	9,028	9,075

[1]Includes dried and concentrated skimmilk, buttermilk and whey manufactured for animal feed.
[2]Dry equivalent of skimmilk, buttermilk, whey and whole milk estimated fed on farms.
[3]Average 1934-1940.

PRODUCTION OF HARVESTED SOYBEANS

	1,000 bu.
1930	13,929
1940	77,468
1941	105,587
1942	187,155
1943	193,125
1944	192,863
1945	191,722*
1946	191,912*

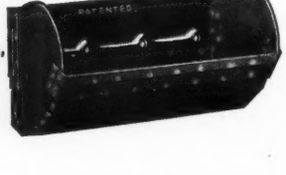
*Preliminary figures SOYBEAN DIGEST, Dec., 1946 (Average annual production of soybeans for 1935-39 was 56,167,000 bu.)

SOYBEAN OIL MEAL FOR YEARS 1930-40

	1,000 Tons
1930	98
1931	113
1932	85
1933	74
1934	223
1935	600
1936	492
1937	717
1938	1,076
1939	1,343
Avg.	482

Source of Information on meals: U. S. D. A. Agric. Statistics (1937, 38, 42, 43, 45)
U. S. D. A. Feed Situation, December 1946.

THE FACT STILL REMAINS THAT SUPERIOR ELEVATOR CUPS "DP" - "OK" - "CC" - "V" are MADE STRONGER will LAST LONGER have GREATER CAPACITY and will operate more efficiently at less cost than other elevator cups.



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nitrogen. For the critical animals, especially young growing poultry and immature swine, soybean oil meal must be properly cooked during processing for optimum protein efficiency.

Raw soybeans do not produce good growth when fed to these critical animals and over-heated soybean oil meal is not a good source of protein as the amino acid lysine is reduced considerably by overheating. Grain proteins are sadly lacking in lysine, the amino acid so essential for growth. As you will see in Table II, lysine is one of the redeeming features of a properly processed soybean oil meal. The soybean processing industry must assume the responsibility for proper cooking of soybean oil meal.

Soybean oil meal, even though it is properly cooked, gives better results in growing rations for critical animals when used in combination with some animal protein. There is contained in most animal protein concentrates a nutrient, referred to by some investigators as a protein factor and by others as a vitamin-like factor, which supplements soybean oil meal and other vegetable proteins. This nutrient factor is found very abundantly in sardine and Menhaden fish meals, the condensed fish solubles from the processing of these fish, all milk products, animal liver meal and liver extracts. Apparently this factor needed by soybean oil meal is not contained at a significant level in present-day grades of meat and bone scraps and tankage.

BETTER VARIETIES

There is a reasonable possibility that present-day soybean oil meal can be further improved through the development of one or more satisfactory milling varieties of soybeans with a higher content of the essential amino acids, especially methionine and possibly cystine and valine, than contained in the predominant varieties currently available to soybean processors. Experiments have shown that soybean oil meal considered properly cooked during processing will respond to added methionine. This is a problem for the agronomists. It is also one phase of a seed selection problem which a special committee of the Soybean Research Council, National Soybean Processors Association, hopes to develop within the year to a point where it will have something rather concrete to discuss at a pre-arranged meeting with J. L. Cartter of the U. S. Regional Soybean Laboratory, his associates and others who are interested.

Soybean oil meal compares favorably with grains, grain by-products and vegetable concentrates and even with some animal by-products in content of essential B-complex vitamins. Nevertheless, careful consideration must be given to the addition of good sources of B-complex vitamins in poultry and hog rations containing a considerable level of soybean oil meal. Riboflavin, a member of the B-complex family, is most likely to be deficient in rations designed for growth and reproduction. It is contained in appreciable quantity in milk products, good quality alfalfa meal products, animal liver meal, dried brewers yeast, dried distillers and fermentation solubles. The principal reliable sources of riboflavin available during the war period were dried distillers and fermentation solubles, and as a concentrated synthetic product.

There are other vitamins of the B-complex family that are important in rations for poultry and swine, but for the most part these are fairly well taken care of when natural sources of riboflavin are used. Vitamins A and D are not a specific problem in the use of soybean oil meal for these critical animals because in most cases it is customary to add them anyway.

It is very important that attention be given to essential minerals, especially calcium and phosphorus, and sometimes iodine, in substituting soybean oil meal for a large part of the animal protein sources formerly used extensively in rations for poultry and hogs. Salt needs to be provided also, but this is true of all rations. Where soybean oil meal is to replace tankage and meat scraps as a protein supplement to corn for growing and fattening hogs, it is quite simple to supply the needed minerals through free-choice feeding with a mixture consisting of 2 parts pulverized limestone, 2 parts steamed bone meal or defluorinated rock phosphate, and 1 part iodized salt.

Purdue University has had very good

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Department W-9

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The old method of tramping down beans in opening up a field, getting less than half the crop on the opening cut is a thing of the past. There's no tramping down of beans with a Massey-Harris Self-Propelled Combine.

Not only do you save more beans, but more go into the grain tank . . . thanks to the forty-odd years of Massey-Harris "know-how" that developed the raspbar cylinder, straight-through separation, and nine years ago, the self-propelled.

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success by offering the following mineral mixture, self-fed free choice, or by mixing it in with soybean oil meal and then feeding additional salt, free choice. This is Purdue Mineral Mixture No. 6 which consists of 10 pounds pulverized limestone, 10 pounds steamed bone meal, and 1 pound salt. When they premix the minerals with soybean oil meal, they recommend 100 pounds of this mineral mixture to 500 pounds of soybean oil meal.

As indicated before, a mixture of protein supplements is better for hogs than soybean oil meal alone as a source of protein. Purdue University and various other state experiment stations have had very good success with blends of meat and bone scraps or tankage, fish meal, soybean oil meal, and sometimes they also include such other vegetable proteins as cottonseed meal and linseed oil meal. These rations are for growing and fattening hogs placed on feed at initial weights of 60 to 75 pounds. They always differentiate between hogs fed on pasture and those fed in dry lot. When the hogs are fed in dry lot they include a good grade of alfalfa leaf meal at 10 percent of the total weight of the protein supplement. A simple mineral mixture such as given above is either self-fed free choice or mixed at the rate of about 10 percent in with the protein supplement.

TABLE II: AMINO ACID ANALYSIS—OIL SEED MEALS
(Dried Skimmilk and Corn for Comparison)

Amino Acid	Dried Skimmilk 34%	Linseed Oil Meal 33%	Soybean Oil Meal 45%	Cottonseed Oil Meal 42%	Corn Gluten Meal 42%	Peanut Oil Meal 45%	Whole Corn 9%
	%	%	%	%	%	%	%
Arginine	1.46	2.04	2.61	3.11	1.30	4.46	0.36
Histidine	0.85	0.49	1.03	1.09	0.71	0.95	0.22
Lysine	2.55	0.82	2.43	1.13	0.46	1.35	0.23
Tyrosine	1.80	1.68	1.85	1.34	2.60	1.98	0.55
Tryptophane	0.54	0.63	0.63	0.55	0.25	0.45	0.05
Phenylalanine	1.93	1.85	1.85	2.77	2.77	2.43	0.41
Cystine	0.37	0.53	0.59	0.84	0.50	0.72	0.10
Methionine	1.12	0.99	0.81	0.67	2.31	0.41	
Threonine	1.56	1.68	1.80	1.26	1.68	0.68	0.32
Leucine	5.10		3.60	5.88	10.50	4.50	1.94
Isoleucine	1.53	1.15	1.80	1.47	2.10	1.58	0.32
Valine	2.20	1.98	1.58	2.94	2.10	3.15	0.41
Glycine	0.13		0.45	2.22	1.80	2.52	

THE AMINO ACID REQUIREMENTS OF GROWING RATS
(Ref: Rose, W. C., SCIENCE 86:298-300 (1937)

Arginine	0.2	Lysine	1.0	Valine	0.7
Histidine	0.4	Methionine	0.6	Phenylalanine	0.7
Isoleucine	0.5	Tryptophane	0.2	Threonine	0.6
Leucine	0.9				

Reference: Calculations of amino acid values from: AMINO ACID COMPOSITION OF PROTEIN AND FOODS, Block and Bohling. Thomas. 1945.
THE AMINO ACIDS. Proceedings fifth annual meeting Nutrition Council of the Feed Manufacturers Association, pp 8-15; R. J. Block, May 3-5, 1945.
Prepared by: Archer-Daniels-Midland Company, Department of Nutritional Research, October 17, 1945.

Salt is always fed in addition to the mineral mixture. As an illustration of the protein mixture for growing and fattening hogs that has given very satisfactory results, I am listing here Purdue University's Supplements C and 5. Supplement C is for use when good pasture is available, and Supplement 5 is for dry lot feeding.

PURDUE SUPPLEMENT C

Meat & Bone Scraps	20%
Fish meal	20%
Soybean Oil Meal	40%
Cottonseed Oil Meal	10%
Linseed Oil Meal	10%

PURDUE SUPPLEMENT 5

Meat & Bone Scraps	20%
Fish Meal	20%
Soybean Oil Meal	40%
Cottonseed Oil Meal	10%
Alfalfa Leaf Meal	10%

As I have said before, the above supple-

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ments have given very satisfactory results for growing and fattening hogs. The results, however, have not been very satisfactory when similar supplements were fed to brood sows or weanling pigs in dry lot. The universities of Illinois and Wisconsin have both done considerable work on this problem. The deficiency has not been protein, but instead a deficiency in certain vitamins or vitamin-like factors. Soybean oil meal has not been directly the cause, but has aggravated the condition when used at high levels because of its apparent low content of the essential vitamin-like complex. The known vitamin-B-complex factor or factors are not the entire answer. Even animal proteins are lacking in the required factors. One of the best sources of the entire vitamin complex including the unnamed factor or factors is alfalfa products, especially a good grade of alfalfa leaf meal.

BEST SOURCE OF B-COMPLEX

Satisfactory results have been reported for reproduction and growth of weanling pigs on rations containing 10 percent of alfalfa leaf meal. This means 10 percent of the entire ration, including corn and the protein supplements, with the protein part of the ration formulated something like Purdue's Supplement 5: that is, with the exception of the alfalfa leaf meal, which would have to be increased considerably to supply 10 percent of the final ration. Please remember that all this precaution applies to brood sows and young pigs raised in dry lot. A simple supplement such as Purdue's Supplement C will give satisfactory results when the brood sows and the young pigs have access to good pasture.

Similar precautions on minerals and natural vitamin supplements apply to poultry of similar ages, as to hogs. Probably the best evidence that soybean oil meal can be used at very substantial levels in feed mixtures for poultry and hogs is the success on record during the war years of feed scarcity and feed allocation with commercial manufactured feeds. Many feed manufacturers have become well versed through their own efforts and the efforts of nutritionists at many of our agricultural experiment stations on the proper use of soybean oil meal in feeds for livestock and poultry, and they have a very high respect for this still rather new protein supplement.

UNKNOWN FACTORS

Better results will be had when we know even more about some of the unknown nutritional factors required by livestock and poultry. These nutritional problems are not necessarily the fault of soybean oil meal, but typify a condition of our era and common to nutrition in general.

There isn't any particular problem in using soybean oil meal as a protein supplement for dairy and beef cattle or for sheep, because vegetable proteins have been used for these animals as a principal source of protein to supplement grains and roughages during all of our years of more intensive feeding.

For these animals urea has possibilities of becoming a competitor of soybean oil meal and other vegetable proteins. When urea is used in mixed feeds for cattle and sheep it is important that raw soybeans or insufficiently cooked soybean oil meal be excluded. This is because of the urease contained in these raw soybean products and the fact that this enzyme may cause urea to decompose, with a loss of nitrogen as ammonia if the raw soybean and urea are in a blend that has been mixed or stored for any considerable length of time.

As I have said before, if proteins were to be fed at optimum levels, we have never yet produced more than half enough to meet the demand for a full feeding program of livestock and poultry. With a hog population equal to 1940, hogs alone could consume 3 million tons of soybean oil meal annually. This is on the basis of using it conservatively and along with animal protein. Our usual poultry population can also consume approximately 800,000 tons of soybean oil meal with soybean oil meal used at more conservative levels than was necessary during the war years.

The soy flour industry, represented principally by the Soy Flour Association and its technical group, the Soya Food Research Council, has been extremely busy during the past few years in digging up facts on soy flour for the various government agencies and our domestic trade. Information was wanted and has been obtained in most instances on such problems as the nutritional, economical and product quality aspects of using soy flour in various foods such as bread and numerous other baked goods, macaroni, dehydrated soups, beverages, prepared mixes of different types and in meat products, such as sausage and the like.

Mr. A. E. Leger, president of the Soy Flour Association, covered most of this subject in his address before the meeting of the American Soybean Association at St. Louis last August, and this address was published in its entirety in the September 1946 issue of the *Soybean Digest*. I will only attempt to give you some of the highlights with perhaps a little more emphasis than he made on some of the remaining problems. As Mr. Leger has said, various research projects are under way or have been completed in the state of Illinois, Purdue University, University of Minnesota, Kansas State College, University of Pittsburg, Midwest Laboratories, and at other public institutions.

SOY FLOUR PROJECTS

These projects were concerned with such things as taste appeal of soy bread after continuous use of it; effect of different levels and of different types of soy flours on the baking qualities of bread; stability of soy flour; insects infesting soy flour during storage; and numerous other types of projects.

Dr. A. K. Smith here at this U. S. Regional Laboratory has done considerable work on the matter of the proper protein factor to be used for soy flour—that is, the factor to be used in converting Kjeldahl nitrogen to protein. The National Re-

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search Council and consequently the Bureau of Human Nutrition and Home Economics, USDA, are insisting on the factor of 5.7 in contrast to the commonly used factor 6.25. The low factor is unfavorable to soy flour and apparently is not correct. The 6.25 factor is too high, but the one commonly used for similar noncereal products in the feed and food world. We need the assistance of your Regional Laboratory in establishing the correct factor, which seems to be, according to Dr. Smith and his associates, approximately 5.9.

Our soy flour industry can certainly use to advantage all the technical assistance you can spare on several current projects pertaining to soy flour. The following assignments are suggested for your consideration:

(1) Express numerically some of the specific observable functions of soy flour in baked goods and the like.

(2) Determine effect of using special varieties versus present selected milling varieties for the production of soy flour by the methods commonly used by our industry for its manufacture.

(3) Explore methods of manufacturing soy flour to see if it is economically possible to effect improvements in quality aspects such as thermophilic bacteria content, flavor, color, particle size and certain functional characteristics such as volume, crumb texture and shelf life of baked goods, especially bread.

(4) Develop a better consumer acceptance for various foods containing proper amounts of soy flour for product quality and improved nutrition.

The individual firms of our Association are hard at work on these and other problems and through the Association are supporting several important projects at the present time. I believe that a great deal can be accomplished in addition to what we are doing by our working cooperatively with the various agencies as represented here. The Northern Regional Laboratory here at Peoria can especially help our industry materially. If you decide to accommodate more work of this nature in your program, I recommend an early meeting between our technical men and the ones you select for this work to discuss our problems in detail and to lay out an extensive program for future cooperative research work.

—sbd—

CONVENTION

(Continued from page 13)

Farm and the Ohio State experimental plots, where experimental soybean work is under way.

At the 160-acre Madison County farm, some 40 miles from the Ohio State campus near London, Ohio, a rotation experiment has been in progress since 1939. Here in one of Ohio's important soybean producing counties, work is being done to compare a series of rotations involving soybeans with other rotation series.

H. W. Rogers is superintendent of the Madison County farm, which was established 30 years ago and is known as one of the state's outstanding livestock farms, as well as for its soybean project. The farm is managed under a cooperative agreement between the county and the Agricultural Experiment Station.

The University's Sinclair Farm, 5 miles northeast of the campus, is devoted largely to cultural experiments. Sixty acres of soybeans have been planted here to compare row with solid planting, different methods and numbers of cultivation, and methods and rates of fertilizer application.

At Ohio State's experimental plots just west of the main campus, considerable research is being conducted. Visitors may see the results of variety testing, cultural experiments, demonstrations of vegetable varieties, genetic material, a demonstration planting of recommended varieties for states in the soybean belt, chemical weed control work, defoliation experiments, and experiments on dates and methods of planting.

The university's agricultural engineering department will assemble at the experimental plots a display of machinery utilized in soybean production, including planters, harvesters and other cultural implements.

Association members who find the opportunity to visit the main OSU campus will see the largest of Ohio's six state universities preparing for a record-breaking autumn enrollment which is expected to reach 27,000 when classes open on September 30. The university operates on a four-quarter plan, and commencement ceremonies will be held September 3 for graduating seniors among the 12,000 summer quarter students now enrolled.

Among the many points of interest on the 417-acre main campus are Mirror Lake, the center of university traditions where generations of students have conducted initiations, held "sings" and enjoyed concerts; WOSU, the university's own 5,000-watt broadcasting station where visitors may see all phases of radio work; and Ohio Stadium, which has a permanent seating capacity of 63,000 and has accommodated as many as 90,000 spectators.

Across the Olentangy River is University Farm, consisting of 900 acres with modern buildings. Here modern farm methods are employed and experimental work is carried on for the benefit of students and the farmers of Ohio. Seven miles north of the campus is Don Scott Field, the university airport.

—sbd—

EDITOR CLARK DEAD

Charles Schmucker Clark, 83, founder and publisher of the *Grain and Feed Journals, Consolidated* at Chicago, died June 16 after an illness of 3 months.

Clark established the *Grain Dealers Journal*, as it was then called, in 1898, and managed it successfully until his death. With local Indiana associations for a nucleus, he was responsible for the organization of the Grain Dealers National Association at a meeting in Chicago in 1896. Later he was instrumental in establishing many of the state associations.

He was also active in promoting the federal government's grain standards act, and in organizing the Grain Dealers Mutual Fire Insurance Co., of which he became president.

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CROP NEEDS GOOD WEATHER

With very adverse planting and growing weather throughout much of June in many of the heaviest soybean growing areas, there was still a considerable acreage to be planted July 1, *Soybean Digest* crop reporters say.

Floods and heavy rains which made it impossible to plant other crops in time for maturity, resulted in a larger soybean acreage than earlier intended in most of the leading soybean growing states. However, there are many spots that will not dry out in time even for soybeans.

Early planted beans look promising but otherwise lower yields than in the past few years are expected, unless exceedingly favorable weather prevails. The July 10 crop report of the U. S. Department of Agriculture indicated 10.6 million acres of Soybeans for harvest nationally, or a million acres above 1946. Soybean acreage planted in the North Central States is 13% above last year U. S. D. A. report.

Reports from correspondents follow, for July 1 unless otherwise noted:

ARKANSAS

Jacob Hartz, Stuttgart, for east central: Planting date normal. Acreage about same as 1946. Most beans off to good start. Current moisture supply good.

L. M. Humphrey, R. L. Dortch Seed Farms, Scott, for Little Rock area and central: Heavy rains June 1 and 23 hurt stands some but have not seriously reduced acreage, which is slightly over 1946. Condition about normal. Chances for maturity excellent. Current moisture supply ample to too much.

Rock Island Lines crop report: (June 17) Another soybean acreage increase forecast for 1947.

ILLINOIS

Russell S. Davis, Clayton, for east central: Planting a month late and still a sizable portion of crop to be planted. Looks as if quite an acreage will have to be abandoned or seeded too late to mature. Probably 75% of intended acreage will be seeded. Acreage probably equals 1946 now. Chances for maturity very questionable. Few fields have more than their second pair of leaves. Four months of excessive rainfall have put the soil in poorest possible condition to start a crop. Most fields were plowed wet, then rained on; weeks later they were disked wet, some of them seeded, and then flooded. Water has stood in the row on flat land until plants are starving for air. On hill lands rows are gullied. All early plowed fields have had smartweed disked down on them, and a lot of these have been reset by rains too soon following planting. Current conversation: "I have another field of beans to plant, hay is ready to cut, wheat is ready for the binder, and it is still raining. I am whipped."

J. E. Johnson, Champaign for Champaign and adjoining counties: Planting date 10 days later than normal, and July 1 condition 75%. Acreage 5% above 1946. Increase will be largely from drowned out areas in corn fields with a small additional acreage where corn planting was delayed until too late for corn. With good growing conditions crop should mature ahead of frost damage. Seeding now 98% completed. A good percentage of fairly early planting with seeding at intervals when weather would permit. Moisture has brought seed up quickly. With favorable growing conditions and destroying of weeds due to late seedbed preparation see nothing to prevent average yield.

Walter W. McLaughlin, Decatur, for Decatur vicinity: Planting 2-3 weeks late, condition 75% of normal. Heavy rainfall has made it impossible to finish planting beans in these areas and many planted are very weedy. Acreage 90% of 1946. Chances of maturity fairly good for those planted but weeds will cut down yield in wet areas.

H. I. Cohn, Valley Farms, Wright, for central western: (June 28) About one-third of crop planted at near normal date. 80% now in. In this immediate territory rainfall normal except for a few areas which have suffered badly. Late acreage will be planted to beans. Late planted soybeans will bring total acreage about up to 1946. Stands are good for rowed beans. Solid drilled do not look good because of heavy weed and grass infestation. I believe Lincolns planted up to July 15 should mature. We have on many occasions matured Chiefs and Illini planted that late.

Rock Island Lines: (June 17) It is anticipated a record breaking acreage will be planted as soybeans can be planted later

What about Markets for Pelleted *Soybean* Oil Meal?

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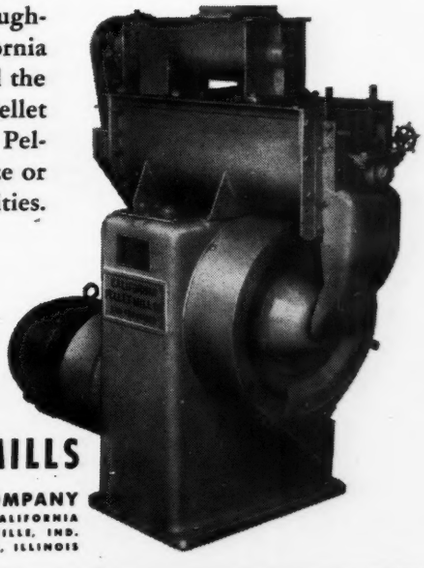

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than any other crop and still produce either beans or a forage crop.

A. J. Surratt, Illinois agricultural statistician, Springfield: Planting date averaged 2 weeks late June 26. About 85% acreage planted. 5,000 acres lost in Mississippi River counties from Quincy south and fully as much more by drowning out of low spots in fields elsewhere. Too late by the time these areas dry out to be planted this year. Acreage 5% above earlier intentions. July 1 condition slightly below average due mainly to cool June and lateness of growth. Chances for maturity average or a little better for two-thirds of state and below average for crop on one-third of acreage which is late. 8% for hay, pasture or silage. 1947 planting progress is definitely in line with that of 1943 and 1945, particularly 1945 which had a cool wet June that slowed growth. On July 1, 1943 growth was more advanced than at present due to warm June weather. Final yield for 1943 was 21.0 and for 1945, 20.0 bu. per acre compared with the 10-year (1936-45) average of 20.7 bu. for Illinois. June closed with general rains tending to be heaviest across central third of state. Planting will be resumed generally July 3 and with sustained good weather will be practically completed July 10.

J. C. Hackleman, agronomy dept., University of Illinois, Urbana: Planting 2 weeks late. 80-90% of intended acreage planted. Acreage larger than earlier intended. Other than being late, beans look good generally. Chances for maturity good with normal or later than normal fall.

Frank S. Garwood & Sons, Stonington, for south central: Plantings 2 weeks late. Acreage increased materially by heavy rainfall, greater than 1946. July 1 condition 80% of normal. Chances for maturity fair.

INDIANA

J. B. Edmondson, Danville, for south central: Planting 3 weeks to month late, stopped about June 25. High price of seed caused many farmers to secure earlier corn hybrids as rains continued and planted even some intended soybean acreage to corn. Acreage 95% of 1946. Practically all beans have at least first leaf spread. Have 75-25 chance of maturing a smaller yield. Fields generally clean with good seedbed. Beans of good color, well inoculated and growing fast. Solid fields in pitiful circumstance, particularly those sown before rains eased off. Good stands in row beans, but farmers still too reluctant to set planter wheels in for narrower rows. Many rows still 40-42 in. apart, with lower yields likely.

K. E. Beeson, Indiana Corn Growers Association, Lafayette: (July 3) Planting generally much later than normal. Floods in river bottoms delayed planting until late June and early July in southwestern Indiana. July 1 condition late. Most fields planted later than normal and beans small. Probably several hundred thousand acres for hay, pasture or silage as usual.

Peter J. Lux, State AAA, Indianapolis, for south central: Planting and condition 2 weeks late. Heavy rains had little effect on Indiana acreage, which is 8% over 1946. Current moisture supply good.

Ersel Walley, Walley Agricultural Service, Inc., Fort Wayne, for N. E. Indiana and N. W. Ohio: Planting 2-3 weeks late. Heavy rains tended to increase acreage, about same as 1946. Condition of 40% of crop normal; too early to predict rest. Large acreage going in up to July 4. Outcome of such acreage depends on weather.

IOWA

Howard L. Roach, Plainfield, for northeast: (June 27) Planting 14 days late. Some beans washed out. Acreage same as 1946. Chances for maturity good. Current moisture ample.

Martin G. Weiss, farm crops department, Iowa State College, Ames: Planting 3 weeks late. Increased acreage all over state, especially in south due to heavy rains, possibly average 10% over 1946. 70% of beans have reasonably good chance of maturing normally. Probably 10-15% of late planted beans for forage.

O. N. LaFollette, State Department of Agriculture, Des Moines: (June 27) Planting date varying from near normal in some northwest areas to 30 days late in much of state. Floods will substantially increase acreage with early maturing varieties being planted. State acreage 15% above 1946. Average condition 30% of normal. With normal season and early varieties on late fields, chance for maturity favorable.

Leslie M. Carl, U. S. Department of Agriculture, Des Moines: Planting date 12-15 days late. State acreage increase 15% above 1946. July 1 condition 75-80% of normal. Some acreage will be subject to frost unless harvested for hay and silage.

Rock Island Lines: (June 17) Extensive replantings will be necessary. A heavy increase in acreage is anticipated as soybeans can be planted up to July 1 and still mature a bean crop and after that date might make some beans and are sure to make excellent forage.

KANSAS

E. A. Cleavinger, extension division, Kansas State College, Manhattan, for eastern: (June 28) Beans planted about recom-

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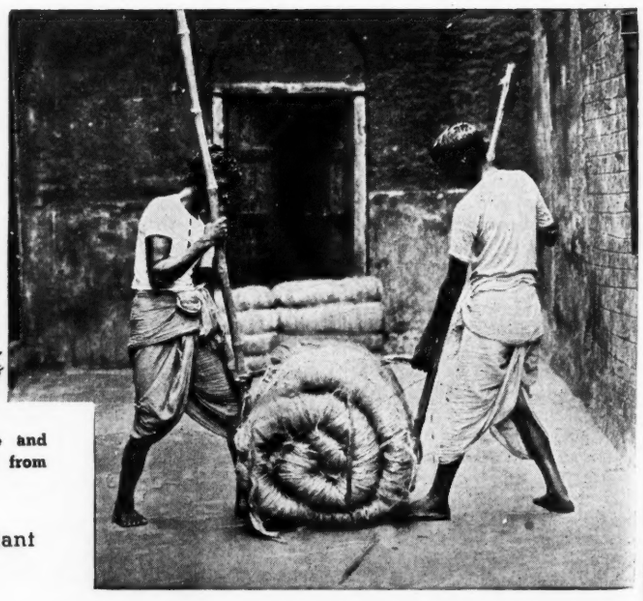

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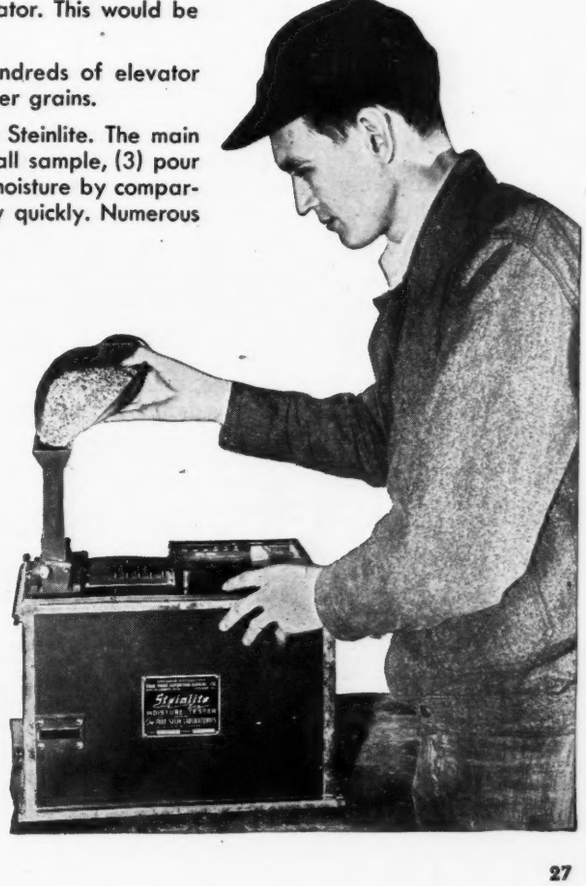

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mended date—last of May, first of June—except those which will replace corn. Soybean acreage flooded is negligible. A very small amount of flooded corn acreage will go to beans. A serious outbreak of garden webworm has ruined many acres of corn, especially late corn in southeast Kansas. Much of this acreage will be planted to soybeans. The insect has also ruined many acres of soybeans. Early stands not hurt as badly as late stands. Some acreage will be replanted.

Rock Island Lines: (June 17) Soybeans expected to show substantial increase over last year.

Kansas Crop Report: (June 24) Planting underway in most eastern areas. In northeastern counties delayed due to wet fields.

KENTUCKY

H. F. Bryant, senior agricultural statistician, Louisville: Planting still going on. Date may be a bit late. Heavy rainfall will probably increase soybean acreage if corn not planted. Large part of soybeans for hay. Current moisture supply on bottoms and flat lands excessive.

MINNESOTA

R. N. Bieter, Farmer Seed & Nursery Co., Faribault, for southeastern: Planting probably 10 days later than normal. Land intended for grain was to some extent converted to soybeans and corn. Acreage probably 15-20% greater than 1946. July 1 condition probably 10 days later than normal. Must have excellent weather in July and August and a late fall for maturity. Has been good demand for soybeans for hay in June. We expect further good demand for soybeans to plant for hay, on early canning pea acreage now being harvested.

R. E. Hodgson, Waseca, for southeast: Planting not much later than normal. No great damage from rain in this immediate locality. Some drowned out in potholes. Acreage about 1-2% above 1946. Condition about normal. Chances for maturity good. Very small proportion used for hay. Looks like good crop so far.

John W. Evans, Montevideo, for southeast central: Planting late. Still planting beans when ground conditions permit. Heavy rains mean considerable ground will not be planted. Less beans than in 1946. Perhaps 10% for forage. Height of beans in most fields 2-5 in. Some stands thus need warm weather. Drove across state from Minneapolis-St. Paul this morning. All crops backward except flax. Less than 10% corn knee high by July 4. At meeting of directors of Minnesota Crop Improvement Association June 30, directors reported general tendency for beans to be behind in season and recent rains eliminating considerable acreage. Over state at large reports would suggest a considerable acreage of soybeans, some sections more than last year.

Rock Island Lines: (June 17) Soybeans are now being planted with expectations of a substantially increased acreage.

MISSISSIPPI

Lacy S. Stoner, Holly Bluff, for Yazoo County: Planting 2 or 3 weeks late. Acreage larger than planned due to early harvesting of oats, and with good moisture in the ground after harvesting, farmers took advantage of the break and followed with beans, completing planting around June 20. Current moisture supply ample.

MISSOURI

Harry A. Plattner, Malta Bend: Planting 2-3 weeks late in most sections. Crop total loss in flooded Missouri river and tributary bottoms. Other plantings late and weedy. Oat land not seeded may go to beans. Condition below normal. Chances for maturity good on early planting.

J. Ross Fleetwood, extension specialist, Columbia: Acreage in bottom land areas in north will be much reduced, but 90-100% of 1946. Beans late and weedy in most areas. Will be some immature beans regardless of frost date because of late plantings. Weather during next 2 weeks will determine whether remainder of beans are planted. If rains cease now quite an acreage will be planted.

W. Ed. Jameson, Fulton, for Callaway County: (June 21) We are having a terribly late season down here and I doubt if we are able to get in the fields for another week but I am going to still plant soybeans up to July 15.

E. M. Poirot, Golden City, for southwest: Planting 2 weeks late. Acreage larger than 1946. Chances for maturity good.

NEBRASKA

John L. Weihing, College of Agriculture, Lincoln, for eastern: Planting 2-3 weeks late. Due to extremely heavy spring and early summer rains, some fields originally planned for corn may be planted to soybeans if seed can be obtained. In general, because of delayed planting of oats and relatively poor condition for corn, the present outlook is for a much larger acreage of soybeans than early spring intentions.

Fremont Cake & Meal Co., Fremont, for eastern: (June 28) Planting 10 days to month late. Heavy rains increased acreage, probably 25% over earlier intentions.

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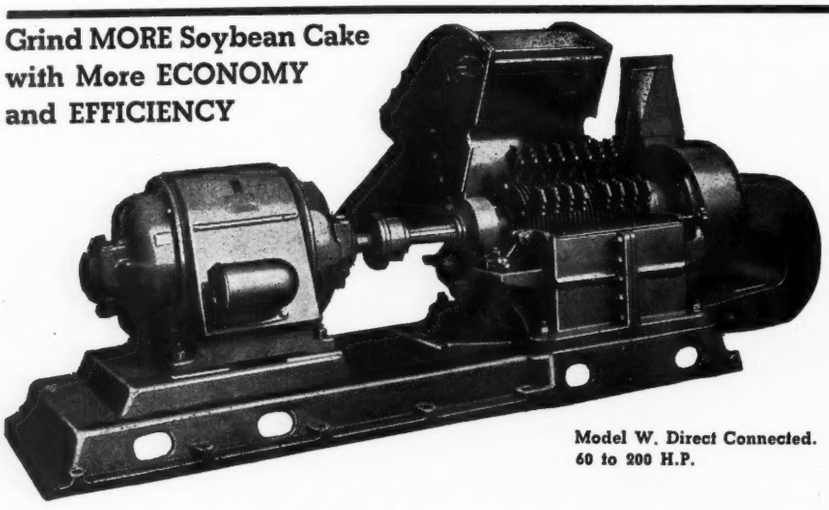

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Chances for maturity good due to planting early beans.

NORTH DAKOTA

C. J. Heltemes, state agricultural statistician, Fargo: Planting date about 2 weeks late. Chances for maturity fair. In areas where old alfalfa stands winterkilled some farmers may plant soybeans for hay.

OHIO

G. G. McIlroy, Irwin, for central: (July 5) Planting 1 month late. Acreage 10% above 1946. Chances for maturity questionable.

D. F. Beard, Ohio State University, Columbus: Planting 3 weeks late. Some land intended for corn or soybeans will be idle. Nevertheless, acreage should equal or exceed normal. Condition late, but emergence good in most fields and beans growing fast. Chances for maturity good if remainder of season favorable.

PENNSYLVANIA

E. L. Gasteiger, Harrisburg: Planting 2 weeks late. Acreage lower in state as whole than earlier intended. Chances for maturity good. Soybeans mostly for hay and soiling. More beans will be used in ground feeds on farms where grown.

SOUTH DAKOTA

H. G. Miller & Son, Garden City, for Clark County: Planting 2-3 weeks late. Some growers have just finished planting. On June 27 hail damaged soybeans considerably. Acreage somewhat increased over earlier intentions. Chances for maturity probably fair depending on fall weather. No corn knee high by July 4 this year.

WEST VIRGINIA

R. J. Friant, extension specialist, Morgantown: (June 28) Planting 2 weeks late. Condition good. Acreage probably 100% of earlier intentions. Precipitation 87% of normal for season. 95% of crop for hay.

—s b d—

HUGHES RETIRES AT IOWA STATE COLLEGE

H. D. Hughes retired July 1 after 38 years service as head of farm crops at Iowa State College.

Hughes relinquished his position as head of farm crops and turned over administrative duties in the agronomy department because of age retirement regulations. He will continue as professor in the department.

Famous for his many contributions to American agriculture through research and teaching, Hughes is credited with discovering an annual type of sweet clover known as "Hubam." He was instrumental in establishing State Corn Yield Tests in 1920.

Hughes, as head of the farm crops subsection, has long given liberal support to soybean improvement projects. The joint author of a bulletin summarizing soybean production for the period 1914-24, Hughes in 1936 helped revise and bring in new phases of the work in a bulletin entitled *Soybeans in Iowa Farming.*

Appreciating the great importance of the position which soybean crops have come to occupy in American agriculture, and especially in the Cornbelt, he has been active in gaining financial support for the extensive soybean research program which has been in progress at Iowa State College. The program, being developed in cooperation with the U. S. Department of Agriculture, has given special emphasis to breeding better varieties of soybeans through hybridization.

In 1917 Hughes served as president of the Association of Seed Analysts. He was chosen vice-president of the American Society of Agronomy in 1944-45 and a year later was named president in recognition of many years service as a Fellow of the Society. Academic honor societies of which he is a member include Alpha Zeta, Gamma Sigma Delta, Phi Kappa Phi and Sigma Xi.

He joined Iowa State College as professor and head of farm crops in 1910 after serving as instructor for 3 years with the agronomy department at Missouri.

H. D. HUGHES

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E. F. "Soybean" JOHNSON

E. F. JOHNSON JOINS LOUISVILLE FIRM

After a year's rest from processing and contract problems, E. F. "Soybean" Johnson has joined Louisville Soy Products Corp., Louisville, Ky., as manager of the oilseeds and oil meals departments, it is announced.

Johnson will also have full charge of research and field work for the firm.

Johnson's work in Arkansas, where he developed the Ralsoy variety, will be remembered—it completely changed the soybean outlook there. Other soy varieties were developed as a result of the new Ralsoy variety. Today many hundreds of acres are produced in the South which would not be growing except for the Ralsoy and other varieties developed by Johnson.

Illinois and Indiana elevators will be seeing more of "Soybean" Johnson this fall when he visits around to renew old acquaintances and check on the progress of the crop.

Johnson is one of the few contractors in the field who both grow and process. His farms in northwestern Ohio still produce bumper crops of soybeans after 35 years in the rotation—making many pessimists wonder why they ever questioned the value of soys in rotation.

"Soybean" is a graduate of Indiana University and holds BS and MS degrees from Purdue—but says he still likes to prove facts for himself. He was formerly in charge of soybean operations for Ralston Purina Co., at St. Louis.

—s b d—

AD CAMPAIGN

An advertising campaign headlining its nationwide service and "The most complete line of petroleum solvents available," has just been announced by A. W. Vallentyne, chairman of the board, American Mineral Spirits Co.

The new series will appear in a selected group of eight trade publications reaching the chemical engineering, paint and extraction fields, including the *Soybean Digest.* The first advertisement appears in this issue.

The American Mineral Spirits Co., whose products bear the name AMSCO, has been manufacturing industrial solvents for 25 years. Its spearhead position is emphasized in the first advertisement with the statement, "Look to Amsco for leadership."

—s b d—

PARIS SOYBEAN MEETING

The first Congress of Soya was held March 16 at the Maison Internationale of the Cite University in Paris, it is reported by Am. Matagrin of Chindrieux, Savoy.

The meeting, an indication of the interest accorded to soya by the French, was organized by the French Bureau of Soya and its president, M. Rene Brochon, with the cooperation of the Experimental Laboratory of Soya and the France-China Association.

The honorary presidency of the Congress was divided between M. Marius Moutet, French foreign minister, and Li-Yu-Ying, president of the French-Chinese Society of Education and warden of the University of Pekin, who as long ago as 1912 published with the agronomist Grandvoinnet a work on soya in French, and set up a little factory making soy milk, flour and oil in the suburbs of Paris.

But the real presidency of the Congress was conferred on Prof. Louis Blaringhen, of the Sorbonne, president of the Academy of Sciences.

Speakers were French research men and members of universities, and the former French minister of agriculture. A paper from A. A. Horvath of the United States was read. There were addresses by President Blaringhen and the ambassador from China.

The agricultural attache of the U. S. and a delegate from the Belgian Association of Soya assisted with the Congress.

—s b d—

WILLIAMS IS DEAD

Prof. Charles B. Williams, 76, first dean of the School of Agriculture and a well known research worker with soybeans at North Carolina State College, Raleigh, died suddenly of a heart attack at his home in Raleigh June 24.

Professor Williams was a member of the North Carolina State College faculty for over 53 years.

His research was conducted largely in the fields of soybeans, soil surveys and fertilizers. In 1918, the *Country Gentleman* selected him as one of the seven top ranking men in the United States from the standpoint of agricultural research.

BEGINS POLYAMIDE RESIN OPERATIONS

After a period of 4 years intensive research and pilot plant operations, General Mill's new commercial polyamide resin plant is being placed in operation. The new plant located in Minneapolis has a capacity of 100,000 pounds per month.

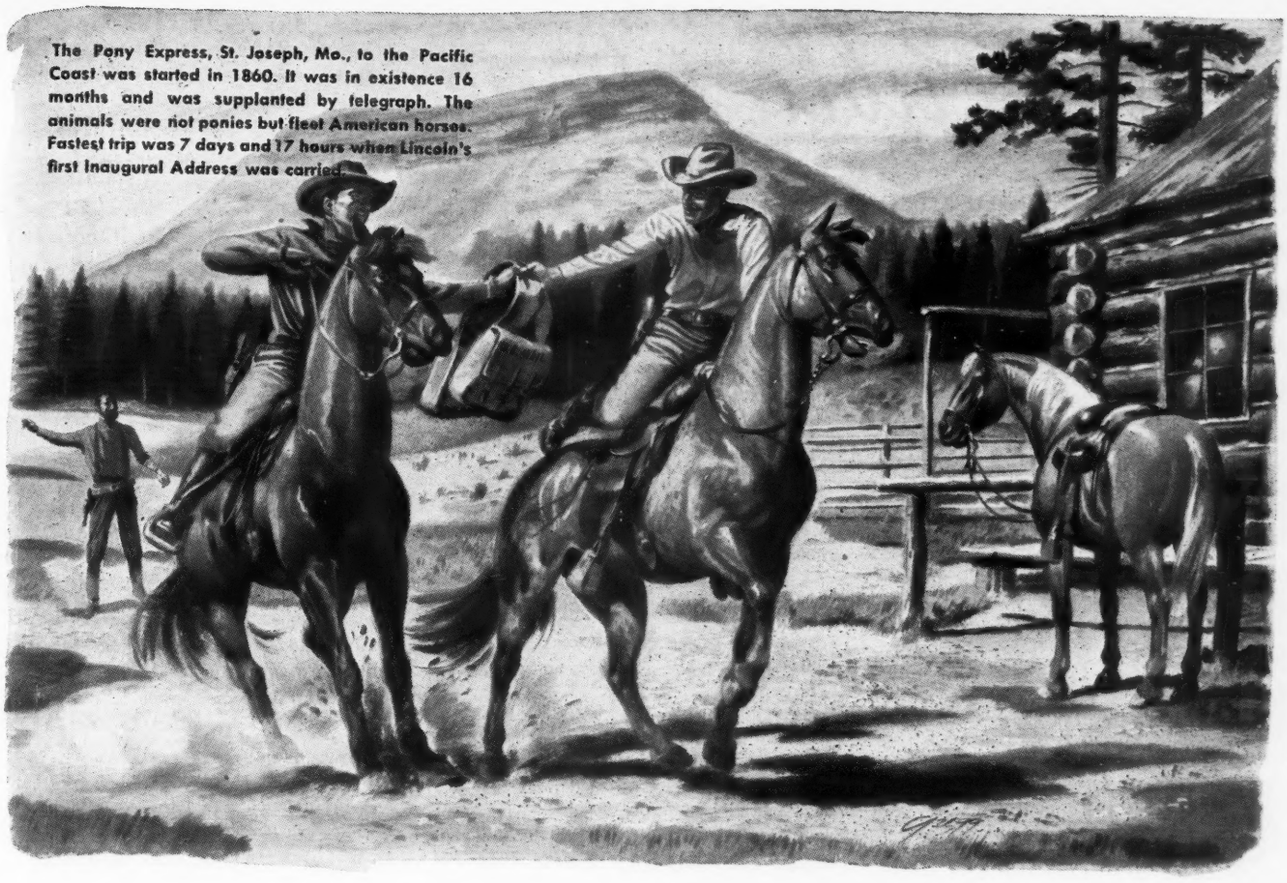
Polyamide resin is produced by a reaction of dimerized and trimerized linoleic and linolenic acids of soybean oil with ethylene diamine. Two by-products—monomeric methyl esters and glycerine—are also produced by this reaction.

There are three grades of polyamide resin available to consumers, all in solid form—hot melt compounded No. 95, hot melt uncompounded No. 94 and the solvent type uncompounded No. 93. The solvent type polyamide resin produces excellent results on coating paper, foil and other sheet materials, especially when good moisture-vapor properties are desired and heat sealing is necessary. The seal obtained with hot melt polyamide resin is a tough resinous seal, and the bond is generally stronger than the material which is being sealed. Polyamide resins heat seal within a temperature range very much lower than that which is customarily employed for other heat sealing coatings.

Whitney H. Eastman, president of the chemical division, in releasing this information to the trade, states that the sale of the products of the polyamide resin plant will be handled through the chemical division sales representatives who have already been appointed on an exclusive territorial basis.

Sewall D. Andrews, Jr., division vice president and director of sales for the chemical division, will be in charge of sales of these new products and will be assisted by Almon G. Hovey.

Steaming molten polyamide resin is piped into 200 pound fiber drums for hardening and shipment at General Mills' new commercial plant in Minneapolis.


The Pony Express, St. Joseph, Mo., to the Pacific Coast was started in 1860. It was in existence 16 months and was supplanted by telegraph. The animals were not ponies but fleet American horses. Fastest trip was 7 days and 17 hours when Lincoln's first Inaugural Address was carried.

13 Years Before the Pony Express....

CHASE was manufacturing Better Bags

• The Pony Express—colorful, daring days when neither snow, nor rain, nor heat, nor angry arrows could stop those intrepid riders!

During this eventful period in our history, Chase was also playing an active and important role. In fact, 13 years prior we first began supplying bags for precious seed, feed, and supplies.

1947 marks our one-hundredth year in this business. This broad experience in providing bags of all types for every need is your positive assurance of a better container for your products.

Your nearby Chase Salesman is trained in the most modern and efficient packaging techniques. He will be glad to discuss your problems with you.

One Hundred Years of Experience in Making Better Bags for Industry and Agriculture.

FOR BETTER BAGS . . . BETTER BUY CHASE

CHASE BAG CO. GENERAL SALES OFFICES, 309 WEST JACKSON BLVD., CHICAGO 6, ILL.

BOISE • BUFFALO • CHAGRIN FALLS, O. • CLEVELAND • CROSSETT, ARK. • DALLAS • DENVER • DETROIT • GOSHEN, IND. HARLINGEN, TEXAS • HUTCHINSON, KAN. • KANSAS CITY • MEMPHIS • MILWAUKEE • MINNEAPOLIS • NEW ORLEANS • NEW YORK OKLAHOMA CITY • ORLANDO, FLA. • PHILADELPHIA • PITTSBURGH • PORTLAND, ORE. • REIDSVILLE N. C. • ST. LOUIS • SALT LAKE CITY • TOLEDO

Publications

Feeding

LIBERATION OF ESSENTIAL AMINO ACIDS FROM RAW, PROPERLY HEATED, AND OVERHEATED SOYBEAN OIL MEAL. By W. H. Riesen, D. R. Clandinin, C. A. Elvehjem and W. W. Cravens, University of Wisconsin. In *Journal of Biological Chemistry.*

A study has been made of the liberation of the essential amino acids by acid, alkaline and pancreatic hydrolysis of raw, properly heated and overheated soybean oil meal.

The results indicate that:

The amount of each of the essential amino acids liberated by acid hydrolysis from soybean oil meal was unaffected by heat treatment, except lysine, arginine and tryptophane. The liberation of these amino acids was decreased by prolonged heating.

The amount of each of the essential amino acids liberated by pancreatic hydrolysis was increased by proper heat treatment and decreased by excessive heat treatment.

The liberation of the essential amino acids from raw soybean oil meal in the presence of sufficient pancreatin to give at least the same active enzyme concentration as used with properly heated meal was not as complete as with properly heated meal, except in the case of lysine. This indicates that the trypsin inhibitor is not the only factor involved in connection with the nutritive value of raw versus properly heated soybean oil meal.

The amino acid composition of proteins based on acid hydrolysis does not necessarily indicate the extent of liberation of each amino acid from the protein by enzymatic digestion.

TRYPSIN INHIBITOR. III. DETERMINATION AND HEAT DESTRUCTION OF THE TRYPSIN INHIBITOR OF SOYBEANS. By Raymond Borchers, C. W. Ackerson and R. M. Sandstedt, Nebraska Agricultural Experiment Station. In *Archives of Biochemistry.*

The announcement of a trypsin inhibitor in unheated soybeans and the demonstration that the feeding of the trypsin inhibitor decreases the growth rate of chicks has opened a new phase of investigation on the nutritive value of the soybean. It is well known that moist heat treatment of soybeans improves their nutritive value.

Since the destruction of the trypsin inhibitor appears to be the primary concern in heat treatment of soybean, investigations made to determine the degree of destruction of the inhibitor by heat are reported in this study.

THE EFFECT OF FEEDING SOYBEANS AND SOYBEAN PRODUCTS ALONE AND IN COMBINATION WITH OTHER FEEDS ON MILK PRODUCTION AND MILK AND BUTTERFAT QUALITY. By C. Y. Cannon, D. L. Espe and E. W. Bird. *Report on Agricultural Research for the Year Ending June 30, 1945.* Iowa Agricultural Experiment Station, Ames.

Iodine numbers of the fat produced by the groups of cows fed soybeans were at times higher and other times lower than the cows fed linseed meal. General trends of the iodine numbers over the periods of experimentation were reasonably alike for the fat produced by all groups of cows, whether fed soybeans or linseed meal.

No significant difference in milk flavor could be detected between the different groups, under conditions obtaining for the experiments.

DISTILLERS' WHEAT DRIED SOLUBLES VERSUS SOYBEAN OIL MEAL FOR FATTENING STEERS. *Fifty-eighth Annual Report Agricultural Experiment Station of the University of Ky.*

Two lots of 14 yearling Hereford steers each were fed 120 days in drylot. Both received the same amounts of shelled corn, corn silage and wheat straw and had access to ground limestone and salt.

As a protein supplement Lot 1 was fed distillers' wheat dried solubles and Lot 2 was fed soybean oil meal. Distillers' solubles were fed at the daily rate of 1.9 pounds per steer, the soybean oil meal at 1.5. Both feeds thus provided the same amount of digestible protein.

Gains, dressing percentage and financial returns were practically the same.

Fertilizers

THE POTASSIUM CONTENT OF FARM CROPS. By H. J. Snider, University of Illinois, in *Better Crops with Plant Food.*

The potassium content of crops is by no means a constant value. It varies with the variety and stage of growth of the crop and also with soil and seasonal conditions. Within certain limits, crops take up potassium in direct proportion to the amount available in soils.

Soybeans are relatively high in potassium and on deficient soils the amount in the beans was increased by potash treatment from 1.61 percent to 1.90 percent on an average in five years at the Illinois station. The straw was relatively low in potassium, apparently because of the large concentration of this element in the beans at maturity of the crop.

BEANS FROM SOILS WITH AND WITHOUT POTASH TREATMENT

Part of plant	No potash	Potash applied
	Oblong (90 lbs.)	
Beans	1.61	1.90
Straw	.37	.51
	Joliet (200 lbs.)	
Beans	1.81	1.87
Straw	.55	.87

Crops

SUPPLEMENTARY AND EMERGENCY CROPS FOR MINNESOTA. By A. C. Arny, Ralph Crim, and R. O. Bridg-

CONVEYING-ELEVATING AND TRANSMISSION MACHINERY

Large stocks carried in our warehouse for prompt shipment.

Our Engineering Department at your service at no extra cost.

Phone — Write or Wire Us

RIECHMAN-CROSBY CO.

Front at Beale, Memphis, Tenn.

DEALERS IN MILL-MACHINERY AND ELECTRICAL SUPPLIES

"Serving Industry since 1895"

ford. *Bulletin 390*, Minnesota Experiment Station, University Farm, St. Paul.

To determine the comparative yielding ability of supplementary and emergency crops for Minnesota, crop tests were made on 56 Minnesota farms and also two experiment station farms.

As an average for all tests at all locations the sorghum, corn, Sudan, and Sudan-soybean mixture in 6-inch rows gave highest forage yields both for dry seasons and seasons with average or above average rainfall.

In average yield of total digestible nutrients in pounds per acre from the six tests for dry seasons, the crops rank in the same order as for forage yields.

A mixture of Sudan-soybeans and soybeans alone led in the dry years in production in pounds per acre of digestible protein. In the years of good rainfall soybeans alone led in pounds of digestible protein per acre followed by the Sudan-soybean mixture.

SOYBEAN FARMING. 44 pages. Soybean Crop Improvement Council, National Soybean Processors Association, 3818 Board of Trade Bldg., Chicago 4, Ill.

During the past 5 years soybeans have been grown for the first time on thousands of farms. Growers want to know the facts about this new crop—its relation to soil productivity—to other crops in the rotation—to soil conservation—the place soybeans should occupy in their farming scheme.

This booklet is published by the Soybean Crop Improvement Council of the Processor Association to give growers a short, easy-to-read report of the answers to questions about the crop.

The information is gleaned mostly from reports, bulletins, circulars and articles prepared by men working with soybeans at our experiment stations and the U. S. Department of Agriculture.

YIELD AND COMPOSITION OF OIL FROM CASTOR BEANS GROWN IN OKLAHOMA. *Technical Bulletin No. T-27.* Oklahoma Agricultural Experiment Station, Stillwater, Okla.

Oklahoma-grown castor beans are fully equal in quality and percentage yield of oil to those grown elsewhere, the tests reported in this bulletin show.

WILL IT GROW IN OKLAHOMA? *Bulletin B-307*, Oklahoma Agricultural Experiment Station, Stillwater, Okla.

A summary of tests and observations on the Oklahoma adaptation of new and unusual crops. Oil-bearing crops include: bene, castor beans, okra, perilla, safflower, sesame and sunflower.

Seed Treatment

SEED TREATMENTS. Aaron W. Welch, leader. *Report on Agricultural Research*, 1946. Part I. Iowa Experiment Station, Ames, Iowa.

Various types of soybean seed treatment tests were conducted in Iowa over a 3-year period, using different chemical dusts. In no case has there been a significant increase in yield from any type of seed treatment. This was in spite of the fact that the wet springs of 1944 and 1945 were conducive to beneficial results.

Past tests have been conducted with high quality seed which germinated 93 percent and higher. Apparently if high-germination, good quality seed is planted, seed treatment is of doubtful benefit.

Studies were made to determine the effects of commercial seed treatments on nodulation by artificially applied nodule bacteria. The chemical dusts used failed to show any detrimental effects, as all plants were well nodulated.

Soy Flour

SOYA NOT A SUBSTITUTE. *Baker and Confectioner* (England.)

Bakers should get over their complex of looking on soy flour as a substitute, F. Longworth of Bolton told a meeting of the Manchester Bakers' Association.

Longworth pointed out that soy flour has a property of high water absorption. Soy protein takes in the water very slowly. When the temperature is raised during baking the protein becomes insoluble and holds all the moisture. On prolonged heating or baking this moisture will not pass off as steam but is held in the goods, making them more moist, easier to cut and less and less crumbly. If this protein is not satisfied in the amount of moisture, it is found that it will take the moisture from the other ingredients in the mix. Longworth advocated that soy flour should take double its weight of water.

Drying Oils

CATALYTIC ISOMERIZATION OF VEGETABLE OILS. S. B. Radlove, H. M. Teeter, and J. C. Cowan (Northern Reg. Res. Lab., Peoria, Ill.). *Official Digest Fed. Paint Varnish Prod. Clubs 265*, 74-84 (1947).

Soybean and linseed oils are isomerized by heating at 160-170° with a catalyst composed of reduced Ni deposited upon carbon black. Details are given of the preparation of the catalyst, selection of the carbon black, effect of metals upon catalyst activity, and variation in conjugation with various grades of soybean oil.

Results of preliminary evaluation of the isomerized oils in paints, varnishes, and alkyd resins are reported. Bodying rate of isomerized linseed oil equals or exceeds that of dehydrated castor oil. Bodying rate of isomerized soybean oil is comparable to that of alkali-refined linseed oil.

Paints made with isomerized soybean oil develop considerable after-tack in conventional formulations. This defect can be overcome by the addition of 5-11 percent of CaO to the pigment. Behavior of these lime-containing paints on accelerated weathering is excellent.

Weeds

DESTRUCTION OF QUACKGRASS RHIZOMES BY APPLICATION OF ISOPROPLYPHENYLCARBAMATE. *Michigan Agricultural Station Quarterly Bulletin*, May, 1947. Michigan Experiment Station, East Lansing, Mich.

Preliminary experiments in the chemical control of this weed seem to afford real promise.

GRITS and FLAKES... FROM THE WORLD OF SOY

The Planters Oil Mill, Tunica, Miss., is constructing a 5,000-ton steel tank for handling of soybeans, which they will crush for the first time this fall. C. E. White is manager. R. M. Julian is the new superintendent of the plant, succeeding B. H. Johnson.

* * * *

V. J. Cismoski, of the Val-A Co., has returned from a 3-week tour of the West Coast, which included attendance at the California Baby Chick Association convention in Santa Barbara. The firm manufactures and distributes poultry and agricultural supplies of all types.

* * * *

June 1 issue of *Southern Lumberman* has an article, "Molds and Bacteria that Delaminate Plywood Bonded with Casein and Soybean Glues," by Clyde M. Christensen and C. S. Moses of Bureau of Plant Industry.

* * * *

Guests at a banquet recently held by the Glidden Co. at Dayton, Ohio were 75 feed dealers who handle Glidden formula feeds.

* * * *

Appointment of Lowell O. Gill as assistant technical director and Dr. Paul R. Shildneck as director of research of A. E. Staley Manufacturing Co. has been announced at Decatur, Ill.

* * * *

Contract for general construction work in connection with General Mills' new chemical plant at Kankakee, Ill., has been awarded to the J. L. Simmons Co., Decatur, Ill. Construction will begin immediately.

* * * *

Fulton Bag and Cotton Mills announces the election of three new members of the board of directors at a recent meeting of the stockholders. They are: George L. Brogdon, company controller; Julius B. Cronheim, manager of the St. Louis plant and Adolph Mayer, manager of the Dallas, Texas, plant. All three men began their careers in the Atlanta offices.

* * * *

A booth, "fibers of tomorrow", is a new feature of the International Exposition of Textiles in Grand Central Palace, New York City. Included is azlon, soybean protein fiber.

* * * *

E. T. Lindsey and McGhee Moore have organized the firm of Lindsey & Moore, Memphis, Tenn., brokers in soybean and cottonseed oils, meal and cake; and will handle spot and futures. Lindsey has operated his own firm for many years. Moore was formerly with Zimmerman, Alderson & Carr. The new firm are members of the Memphis Merchants Exchange Clearance Association.

* * * *

A double-action hammer mill especially designed to crush whole compressed cake material such as soybean, has been announced by the Buffalo Hammer Mill Corp., 27 Washington St., Buffalo 3, N. Y.

* * * *

Dr. R. E. Greenfield has been elected to the board of directors of the A. E. Staley Manufacturing Co., Decatur, Ill. Dr. Greenfield is general superintendent of the company and is widely known in soybean circles.

* * * *

Speaker before the St. Louis Paint and Varnish Production Club June 10 was S. A. Thompson of Archer-Daniels-Midland Co., Minneapolis. His subject, "Soybean-Derived Drying Oils."

* * * *

A 50-page *Bibliography of Phytin (Calcium Phytate) and Inositol,* products of corn steep liquor, has been published by A. E. Staley Manufacturing Co., Decatur, Ill. The book contains all significant references to the products up to July 1946.

* * * *

Glidden Co. is prepared to license anyone in the petroleum industry who wishes to employ the lecithin patents in production and sale of motor fuels, lubricating and cutting oils, Vice President P. E. Sprague has announced.

* * * *

Bemis Bro. Bag Co. has announced the opening of a sales office at 630 Security Building, Phoenix, Ariz. H. O. Parrent, who has been with Bemis for over 20 years, is in charge.

TAGGART OF O'BRIEN CORP. HAS RESIGNED

M. F. TAGGART

The resignation of Matthew F. Taggart as director of research has been announced by F. M. Reece, president of the O'Brien Corp., South Bend, Ind., paint manufacturer. In making the announcement Reece pointed out, however, that Mr. Taggart will maintain his connection with the O'Brien Corp. and spend much of his time doing special research assignments under the direction of the management.

Reece indicated that this change of status, brought about at Mr. Taggart's insistence, was made to allow him more time for the conduct of personal business and affairs.

With the exception of 5 years, from 1917 to 1922, Taggart has been connected with the O'Brien Corp. for 30 years. He has contributed substantially to many of the corporation's widely known technical developments in the paint, varnish and lacquer industry. In addition he has found time for extensive work, nationally, in promoting the wider use of farm products in industry and is a member of the board of governors of the National Farm Chemurgic Council. Taggart's plans for the future include a continuation and enlargement of these worthy activities.

—s b d—

GLIDDEN PROMOTION

Continued rapid expansion of the Glidden Company's extensive food business has led to the appointment of Elmer L. Weber to the position of sales promotion manager of the Durkee Famous Foods division, Dwight P. Joyce, president of The Glidden Co., Cleveland, Ohio, announced.

Weber has served The Glidden Co. as ad-

How to squeeze a soy bean!

No doubt you, too, have heard stories of the marvelous soy bean . . . how science has found such diverse uses for this valuable vegetable as cattle feed and in plastics manufacture.

Now one of the most interesting things about soy beans is the valuable oils they contain. These important oils go into the manufacture of paints, plastics, salad dressings and dozens of other products. But getting all the oils out of the bean, has always been a tough job.

Years ago Phillips research scientists, always interested in the varied problems of industry, tackled this one. They had already developed a process for producing a superior high purity compound called Normal Hexane from natural gasoline. Research demonstrated that this Normal Hexane was particularly well suited to removing oil from soy beans by *solvent extraction.*

Tests revealed that the valuable oils could not only be extracted *cheaper,* by this method, but that a *20% greater yield* was *obtained* with Normal Hexane, as compared to mechanical methods.

Additional research has uncovered more important uses for this superior solvent, so that today, Phillips Petroleum Company is the country's *largest producer* of Normal Hexane, one of an extensive line of commercial solvents that Phillips has developed.

Of course it's a big jump from lubricating oil to soy bean oil, but Phillips scientists are constantly discovering more uses in homes and industries for the products derived from petroleum. Thus, we increase the value of every barrel of oil and foot of gas we take from the earth. And this means new methods and better products for the good of all America.

PHILLIPS PETROLEUM COMPANY
Bartlesville, Oklahoma

Phillips 66

PHILLIPS 66 GASOLINES, LUBRICANTS AND ACCESSORIES FOR CARS, BUSES AND TRUCKS • FUELS, LUBRICANTS AND PRODUCTS FOR FARM AND INDUSTRY • AVIATION GASOLINE AND LUBRICANTS • NATURAL GAS • CHEMICALS • TIRES AND TUBES • NOURLAOC HOME APPLIANCES • PHILCO • SOLVENTS • LIQUEFIED PETROLEUM GAS FOR HOMES AND INDUSTRY • RESEARCH, DEVELOPMENT AND PATENT LICENSING • DOMESTIC AND FOREIGN CRUDE OIL • ENGINEERING SERVICE FOR THE PETROLEUM INDUSTRY • CRUDE OIL PIPELINES • REFINED PRODUCTS PIPELINES • GAS PIPELINES • CARBON BLACK

This recent Phillips Petroleum Company advertisement appeared in THE SATURDAY EVENING POST and explained to millions of readers the advances made by the vegetable oil extraction industry. One important contribution to this progress has been the development of high quality solvents, such as Phillips Normal Hexane.

Phillips Normal Hexane has a narrow boiling range of 150-156°F. This means a low vapor loss and minimum solvent residue in the meal. Uniform quality, low sulfur content, and absence of olefins also aid in producing a premium grade vegetable oil. And because Phillips Petroleum Company operates the world's largest natural gasoline processing facilities, we are the country's largest producer of Normal Hexane and your most dependable source of supply.

Phillips 66 HYDROCARBONS

PHILLIPS PETROLEUM COMPANY

Chemical Products Department

BARTLESVILLE, OKLAHOMA

U. S. Department of Agriculture's new *Yearbook of Agriculture*, 1943-47, is off the press. Named "Science in Farming", the book contains 1,094 pages.

* * * *

"The Versatile Soybean" is an article by Dr. W. J. Morse, of the Bureau of Plant Industry, in the current issue of ECONOMIC BOTANY.

* * * *

O. S. Brock, formerly assistant manager of the Bemis Cotton Mill, Memphis, Tenn., has been appointed manager of the Indianapolis Bleaching Co., Indianapolis, Ind.

* * * *

In order to give Glidden Co. employees additional protection from the hazards of modern living, the Glidden Co. has voluntarily provided group life insurance covering accidental death or dismemberment. The new insurance covers all employees of the company for an amount equal to their present company-paid group life policies.

* * * *

H. W. Galley, manager of the oils division, A. E. Staley Mfg. Co., Decatur, Ill., wrote the guest editorial in the May issue of *American Farm Youth*. His subject: "Soybean Oil—Versatility Plus."

* * * *

ALKYDOL PRODUCTS, *Catalog No. 772, a 28-page booklet about synthetic resins and allied products, has been issued by Alkydol Laboratories, Inc., 3242 S. 50th Ave., Cicero 50, Ill.*

* * * *

The *1947 Seedburo Catalog and Reference Book* is now off the press and available for immediate distribution. It is larger and more complete than ever before. You may obtain your copy by writing Seedburo Equipment Co., 618 W. Jackson Blvd., Chicago 6, Ill.

* * * *

The Southern Cotton Oil Co., Newport, Ark., has completed its season's crush on soybeans, and will begin summer repairs for the new cottonseed and soybean crops this fall.

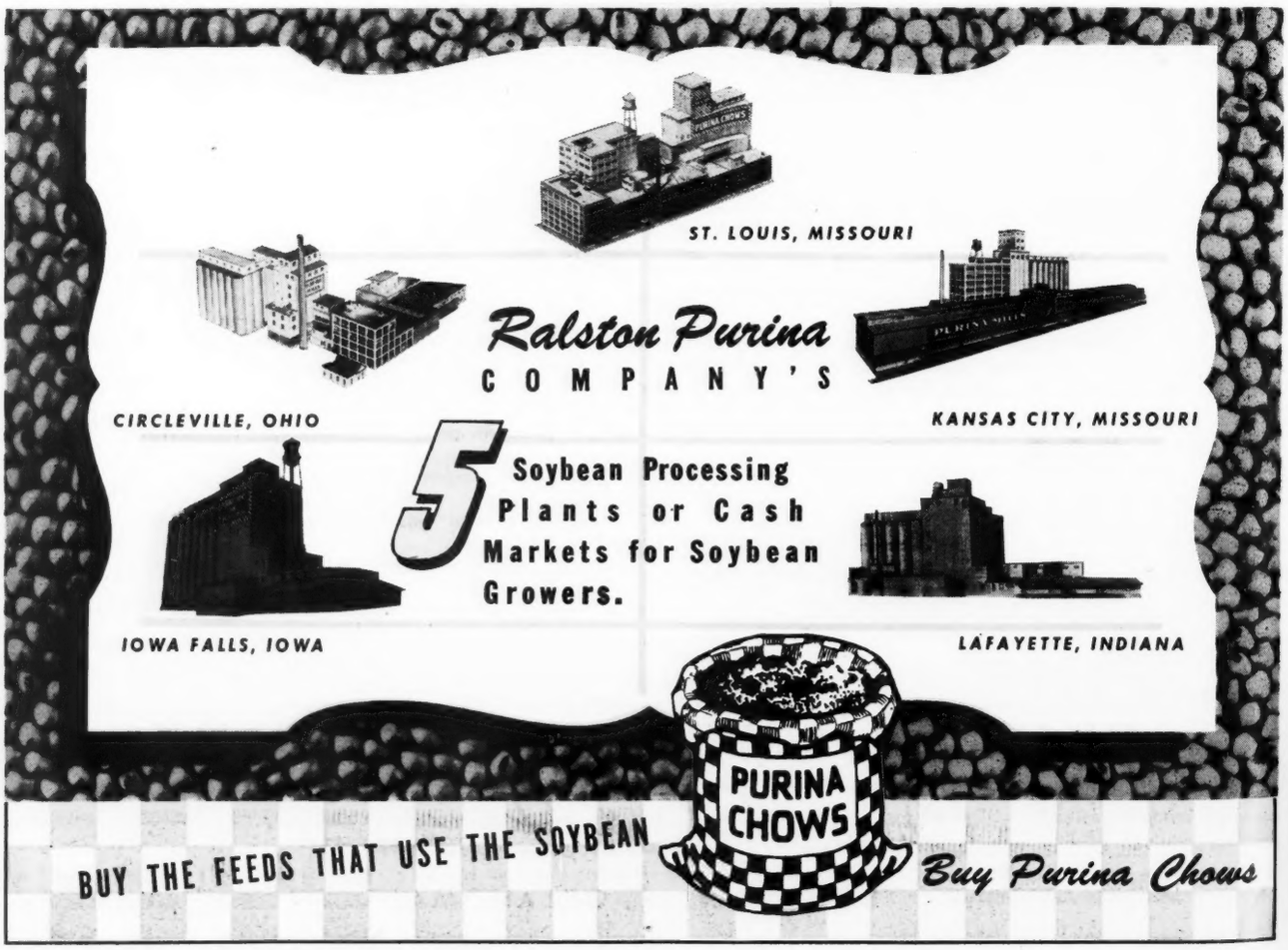
* * * *

E. G. Tenent, Woodson-Tenent Laboratories, Memphis, Tenn., is celebrating the birth of his first grandson, Thomas Murray Ferguson II, June 7.

ELMER L. WEBER

vertising manager for the past 3 years. His office now is located in the company's executive headquarters, 1396 Union Commerce Bldg.

Prominent in Cleveland advertising and sales activities for many years, Mr. Weber now is president of the Sales Executives Club of Cleveland and a member of the Hermit and Advertising Clubs.



INVENTORIES COLLATERALIZED
FOR COMMERCIAL LOANS

ADDITIONAL WORKING CAPITAL *Means . . .*

- Cash and Quantity Discounts
- Pre-Season Purchasing
- Expansion Program
- Maximum Credit
- Adequate Inventories

Your **INVENTORY** *of* **SOY-BEANS** *and* **OIL**

remaining right on the premises of your business location can be used as preferred collateral for additional working capital *through our*

FIELD WAREHOUSING SERVICE

★

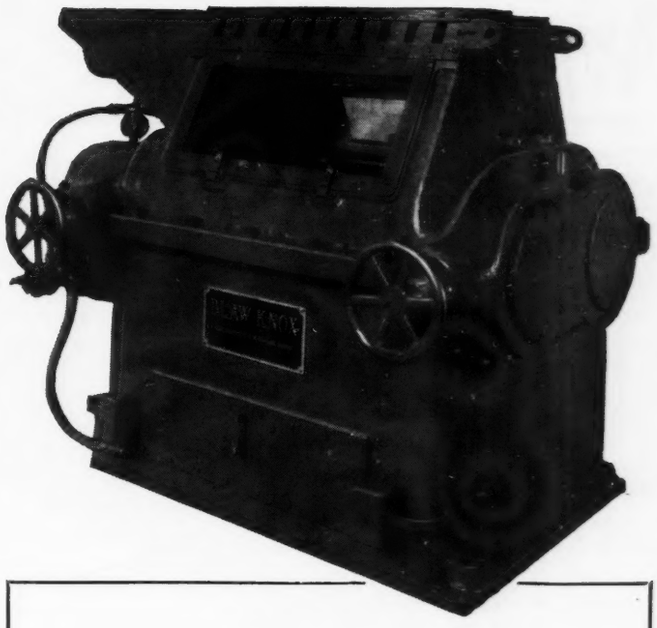
WRITE OR WIRE OUR NEAREST OFFICE

ST. LOUIS TERMINAL WAREHOUSE CO.

SERVING INDUSTRY OVER TWENTY YEARS

ST. LOUIS 2, MO. 826 Clark • CHICAGO 3, ILL. First Natl. Bank Bldg. • CINCINNATI 2, OHIO Carew Tower

DALLAS 1, TEXAS Construction Bldg. • KANSAS CITY 6, MO. Waldheim Bldg. • MEMPHIS 3, TENN. Sterick Bldg.



Up to

80 TONS OF FLAKE

every 24 hours

LEWIS HEAVY-DUTY FLAKING MILL

Right now batteries of these mills in many leading Soybean Plants are reducing manufacturing costs. They can do the same for you.

ADVANTAGES: Produces a uniform thickness of flake regardless of size of the cracked bean entering the rolls . . . Instant feed adjustment and even distribution of bean to the rolls . . . Flaking Roll can be retracted and returned to original position without change of flake thickness . . . Scrapers keep rolls clean . . . Quiet worm gear drive, anti-friction bearings and forced feed lubrication to all essential moving parts . . . Heavy construction for a long life of trouble-free operation.

Please write for complete data.

LEWIS FOUNDRY & MACHINE

DIVISION OF BLAW-KNOX COMPANY, PITTSBURGH, PA.

WASHINGTON Digest

Research Report

Four main lines of soybean research are given 1-A priority in recommendations of the soybean-flaxseed advisory committee on work which might be conducted under the Hope-Flannagan agricultural marketing and research law. They are:

1. Intensified research into improving the flavor stability of soybean oil.
2. More research on production and use of oilseed proteins.
3. Improvement in farm storage for soybeans.
4. An improved system of grading and market news service.

A limited supply of the committee's recommendations will be available in mimeographed form from USDA late this month. The recommendations are tentative. They are subject to selection of actual projects by the national advisory committee on research.

USDA officials have worked up actual research projects totalling about 25 million dollars and covering all phases of agriculture. These will be screened by the national committee until the total estimated outlay comes within the funds appropriated by Congress.

The cause of reversion in soybean oil is the object of much research now being conducted. Scientists working on the problem think it can be licked.

The committee's report states that "the principal obstacle at present is the lack of resources to permit attacking the problem on a sufficiently large scale." Under the law, the Secretary of Agriculture can allocate funds both to private and governmental research agencies, so that work now being conducted by a private firm could be supplemented with federal funds.

Specific proposals recommended for more research into oilseed proteins include:

Disposal of soybean whey resulting from the manufacture of soybean protein; fundamental research on soybean and linseed protein, including studies of their fractionation, viscosity, molecular weight, amino acid composition, and chemical modifications; studies of the jelling and adhesive properties of soybean protein and its behavior as a protective colloid; and studies on new uses for soybean and linseed protein.

One aim of research into farm storage of soybeans is to enable producers to spread marketings out over a longer period. Here are the specific projects recommended:

By PORTER M. HEDGE
Washington Correspondent for The Soybean Digest

Present facilities; type and cost of farm storage for soybeans; structural design; the maximum moisture content at which soybeans can be stored satisfactorily; credit available to farmers on farm-stored commodities; the relative cost of delivering soybeans directly to country elevators compared with storing them on the farm; the effects of tenancy on farm storage of soybeans; the financial advantages or risks involved in holding soybeans for varying periods after the rush marketing season is completed.

On grading of soybeans, the report urges "research to determine methods which would approximate the oil content for small lots as delivered by farmers. A continuing study should also be made of the oil content by areas and varieties over a period of years."

The committee wants economic information on soybeans consolidated and published at frequent intervals. It proposes market services showing current and futures prices on oilseeds, oils, and meal as well as frequent reports of the situation in principal foreign areas which would affect U. S. markets and prices.

Specifically, it suggests consumption and production statistics for soy flour, industrial soybean products such as lecithin and alpha protein, canned green soybeans, dried soybeans, roasted soybeans, and products such as soy milk and soy cheese. It considers the government's present reporting staff inadequate to supply detailed current information on foreign oils, particularly in the Far East.

In the production field, the report makes detailed recommendations for more research to find higher-yielding, insect- and disease-resisting varieties. It proposes studies on certain cultural practices such as rate of planting, width of rows, preparation of seedbeds, time of planting for best seed and quality of oil.

It proposes studies on soil management, soil conservation, and economic research on costs of producing soybeans and potential market outlets for soybean oil meal.

Other recommendations in the processing field cover:

Improvement of the drying characteristics of soybean oil and finding other industrial outlets against the time of future surpluses; improved techniques for fractionating soybean oil; the production of fatty derivatives for industrial uses; development of improved

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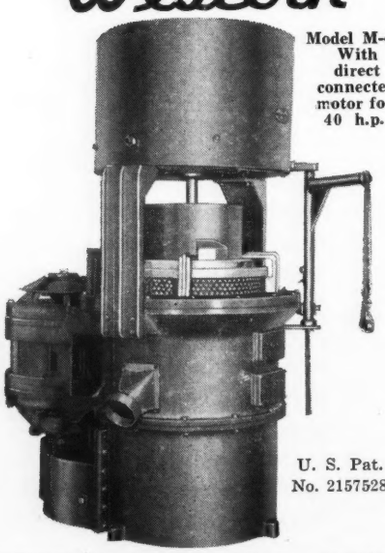

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processing techniques including the use of solvents other than hydrocarbons for extracting oil from soybeans and the use of fractionating processes for refining soybean oil, separating the oil and obtaining purified fatty substances for use as industrial raw materials.

A section on nutrition and consumer preferences recommends a survey of reasons for consumer resistance to such products as soy flour, canned and dried soybeans. It also proposes a study of consumer preferences for competitive edible oil products from soybeans, such as margarine, shortening, salad and cooking oil, salad dressing and mayonnaise, which also are outlets for cottonseed, corn and peanut oils.

Future in China Some light on the present and probable future of the soybean industry in China proper and Manchuria is shed in a report just issued by USDA's Office of Foreign Agriculture Relations.

It indicates that Chinese exports of soybeans, including Manchuria, are not apt to return to prewar levels, even if peace is restored—unless production is greatly increased.

Domestic requirements have risen in China. Production for 1946 in 22 Chinese provinces and Manchuria combined is estimated at 289.2 million bushels. This is roughly 25 percent below the 1931-37 average.

The crop movement has been hindered by military operations and lack of transportation.

There is a shortage of edible oils in China proper. Arrivals of raw materials from the interior so far have been meager. Shipments from Manchuria, which before the war virtually monopolized exports of soybeans and oil, have been running only a few thousand tons a month, despite the high demands of oil mills.

Manchurian oil mills have been idle since V-J Day. Formerly, they consumed about 28 percent of the crop. Unfavorable prices, limited storage at concentration points, a shortage of bags and inadequate port facilities also have helped to reduce the soybean movement.

As a result, a sizable stockpile of soybeans is believed to have accumulated in Manchuria.

OFAR estimates not more than 7 to 8 million bushels of soybeans will be exported during the 1946-47 season from the Nationalist-controlled area of China.

China proper has never been able to produce enough soybeans to meet its own demands. The need is believed to have increased since the war.

Lower Prices The Bureau of Agricultural Economics predicts somewhat lower prices for fats and oils during 1947-48, but says that prices will remain well above prewar levels.

The Bureau thinks many fats will remain above wartime price ceilings.

The increase in world fats and oils output is expected to continue during the next season, but not enough to allow prewar consumption in the Northern Hemisphere.

U. S. production of fats and oils for 1947-48 is put at more than 10 billion pounds. This compares with an estimated 9.4 billion pounds for the current season. Peak production was 11 billion pounds in 1943-44 when lard and grease output reached an all-time high.

Fats, Oils Production USDA estimates world production of fats, oils and oilseeds in 1946 at 17,696,000 short tons oil content or about 5 percent over 1945.

World soybean production in 1946 is put at 1,501,000 short tons compared with 1,465,000 tons the year before.

There is no estimate on 1947 soybean output, but the estimate of soybeans that will move in international trade this year is 72,000 short tons, only 5,000 over 1945. Before the war, 440,000 short tons (oil content) of soybeans went into the world export trade.

No Changes in Standards USDA has decided against making changes in the official grain standards for soybeans during the current year.

Based on informal hearings at four midwest points, plus written opinions on proposed changes, the Department announced last month it "does not feel warranted in revising the official standards for soybeans at this time."

New Man in PMA A new man, Grant Thompson of Michigan who has been a top official in AAA, is in charge of the feeds division of PMA's grain branch.

Thompson succeeds Emory Jacobs, former head of the division, who has become a PMA fieldman under the new reorganization.

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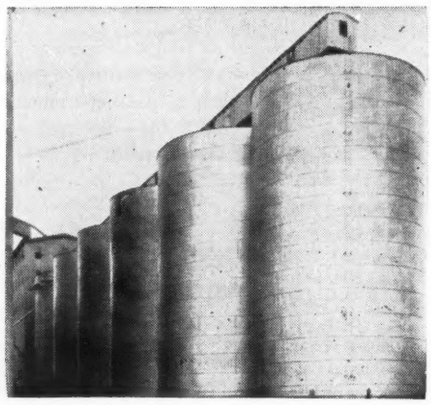

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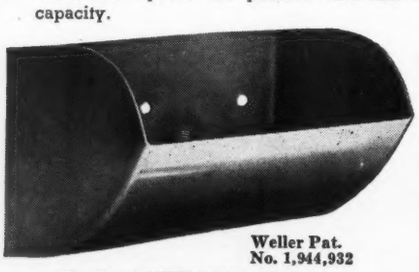

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In The MARKETS

LIGHT ACTIVITY IN MARKETS DURING MONTH OF JUNE

Light activity featured the soybean, oil and oil meal markets in June.

Consumer interest in soybean oil meal was relatively light, but offerings were even lighter much of the time. This commodity paced the spot feedstuffs market for the month. Opening at $65.75 bulk, Decatur basis, oil meal continued the advance begun in May, reaching the highest point since November, $79, June 25. The advance was checked and there was a slight reaction the last few days of the month.

A seasonal decrease in production was said to be a strengthening factor in the upward trend.

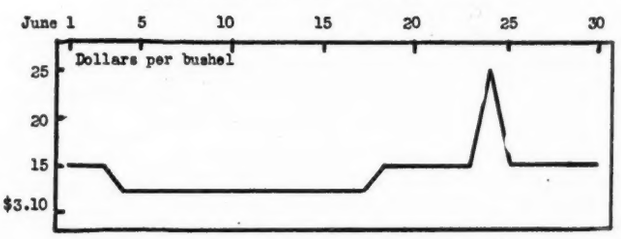
Country movement of soybeans was very light, with crushers actively in the market for such beans as were offered. The heavy rains necessitated larger quantities of soybeans for replanting than had been expected. Only 11 cars were received in Chicago the last week of the month. Some in the trade were hopeful that movement would increase after planting was finally completed.

Chicago market bids for No. 2 soybeans remained at $3.12 to $3.15 all month.

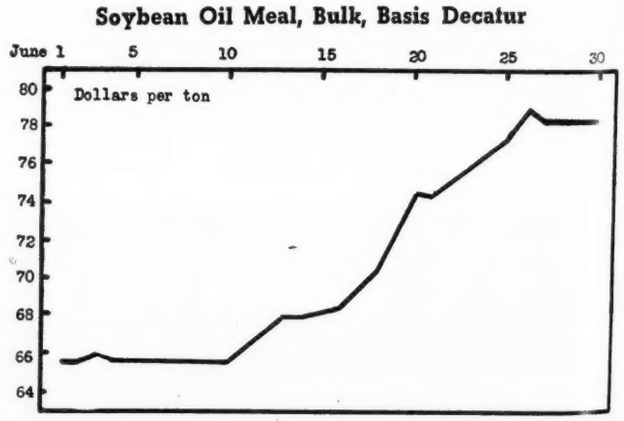
Trading in soybean futures was resumed on the Chicago Board of Trade July 7 after a suspension of 4 years due to a wartime government directive. Trades will be for delivery in November 1947 and March 1948.

No. 3 yellow soybeans will be discounted on futures contracts at 4c per bushel under the contract price. The membership of the Board voted down a proposal calling for a 2c discount.

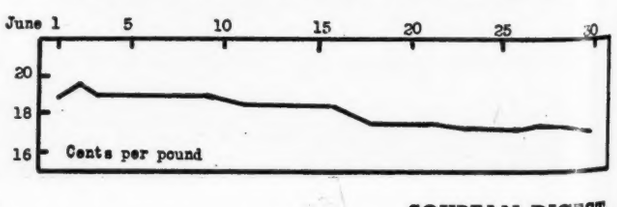
Soybeans, No. 2, Chicago Bids



Soybean Oil Meal, Bulk, Basis Decatur



Soybean Oil, Crude, Tankers, F.O.B. Decatur



Soybean oil lost another 2½c in June, following the general trend in the fats and oils markets. Trading was very light.

Highest price paid for crude oil in tankers, F.O.B. Decatur, was 19¾c June 2. Market reached the low point of 17⅛c June 23-26.

The cottonseed oil and soybean oil futures markets on the New York Produce Exchange are closed Saturdays for the summer through August 30.

*SOYBEAN MEAL FUTURES—MEMPHIS, June 30

Contract—100 tons

Decatur—Sacked basis		Decatur—Bulk basis	
July	$81.00@84.00	July	$77.00@80.00
October	70.00@73.00	October	65.00@68.00
December	63.00@64.50	December	59.00@60.50
January, 1948	63.00@64.00	January, 1948	58.00@60.00
March, 1948	59.00@62.00	March, 1948	55.00@58.00
May, 1948	59.00@61.50	Sales, none.	

Sales, none.

*NEW YORK SOYBEAN OIL FUTURES, June 30

	close	pr. cl.
July	$21.00	$21.00
September	19.50	19.50
October	18.50	18.00
December	16.00	16.00
January, 1948	16.50	16.50
March, 1948	16.50	16.50
May, 1948	16.50	16.50

Total sales, none.

*Reported by Chicago Journal of Commerce.

The Memphis (Tenn.) Merchants Exchange Clearing Association has voted to end trading in bulk soybean oil meal beginning with the May option.

The rules that govern bulk soybean oil meal will be eliminated in the new trading rule book. Present contracts will be "liquidated or transferred to sacked soybean meal contracts without cost to the customer."

● COMMERCIAL SOYBEAN STOCKS. Production and Marketing Administration's commercial grain stock reports.

U. S. Soybeans in Store and Afloat at Domestic Markets

(1,000 bu.)

	May 6	May 13	May 20	May 27
Atlantic Coast	194	197	198	197
Northwestern and Upper Lake	1,629	1,442	1,201	1,013
Lower Lake	2,626	1,990	1,698	1,120
East Central	2,452	2,331	2,248	2,086
West Central Southwestern & Western	1,295	1,082	975	781
Total	8,196	7,042	6,320	5,197
Total Year ago	8,716	8,005	6,757	6,432

U. S. Bonded Soybeans in Store and in Transit in Canada

Total	39	39	39	39

Total North American Commercial Soybean Stocks

Current week	8,235	7,081	6,359	5,236
Year Ago	8,716	8,005	6,757	6,432

U. S. Soybeans in Store and Afloat at Domestic Markets

(1,000 bu.)

	June 3	June 10	June 17	June 24
Atlantic Coast	192	187	170	170
Northwestern and Upper Lake	913	749	641	497
Lower Lake	1,117	924	869	653
East Central	2,024	1,513	1,040	1,178
West Central Southwestern & Western	639	497	438	405
Total current week	4,885	3,870	3,158	2,903
Total Year ago	6,082	5,474	4,732	4,099

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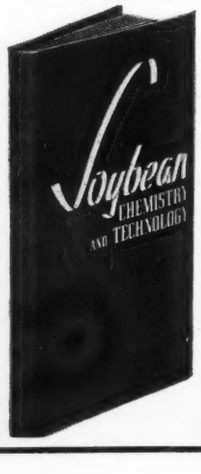

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● SOYBEAN INSPECTIONS. Inspected receipts of soybeans in May were somewhat lower than for the preceding month but slightly above the May average for the crop years 1940-45, according to inspectors' reports to the grain branch of the Production and Marketing Administration. May inspections totaled 3,679 cars compared with 5,852 cars in April and the average for May of 3,307 cars. Inspected receipts October through May this season were 78,948 cars compared with 78,434 cars for the same period last year.

Of the May inspections 75 percent graded No. 2 or better compared with 76 percent in April. Only 70 percent graded No. 2 or better October through May this season compared with 92 percent last year.

● SOYBEAN GLUE IN PLYWOOD. Soybean glue consumed by the softwood plywood industry in April totaled 2,090,000 square feet, reports Bureau of the Census. This compares with 2,192,000 square feet used in March, and 1,878,000 square feet in April 1946.

Phenolic resin glue consumed by the industry in April totaled 3,095,000 square feet; casein glue totaled 468,000. Total glue consumption by the industry for April was 5,908,000. Figures are based on ⅜-inch equivalent.

April glue stocks, in square feet: casein 435,000; soybean 1,609,000; phenolic resin 1,323,000; other 307,000.

● MAY SOYBEAN OIL OUTPUT. May production of crude and refined soybean oil decreased somewhat from March and April, revised figures released by the Bureau of the Census show.

Production of crude soybean oil was reported at 135,889,000 pounds in May, compared with 141,456,000 pounds in April. May production of refined soybean oil was 92,640,000 pounds, April production 115,877,000 pounds.

Factory and warehouse stocks of the crude oil May 31 were 108,868,000 pounds, compared with 89,302,000 April 30. Stocks of refined oil totaled 114,806,000 pounds May 31; 91,327 April 30.

● STANDARD SHORTENING SHIPMENTS. Reported by members of Institute of Shortening Mfrs., Inc., in pounds.

Week ending	
June 7	4,054,559
June 14	4,382,168
June 21	3,749,838
June 28	5,043,338

● DRYING OIL PRODUCTS. Use of soybean oil in drying oil products in 1946 increased over 1945, reports the *Fats and Oils Situation* of the U. S. Department of Agriculture for April-May.

Usage in 1946 was 63,120,000 pounds compared with 45,757,000 pounds in 1945. Use of linseed, tung and oiticica oils also increased, while castor and fish oil usage declined.

Government Orders

● ALLOCATIONS. The U. S. Department of Agriculture announced the following supplemental allocations and exchanges during June (all commercial procurement):

200,000 lbs. soybeans (30,000 lbs. oil content) to Belgium in exchange for Belgian Congo palm oil, the soybeans to be used by the Belgians for experimental purposes; 70,000 lbs. lard to Guadaloupe as an advance against its tentative third quarter allocation of soybean oil; 896,000 lbs. hydrogenated soybean flakes to the Republic of Colombia in exchange for an equivalent quantity, in terms of oil, of Philippine copra; 9,280,000 lbs. No. 2 shelled peanuts to France to replace an equivalent quantity of soybean oil earlier allocated.